
PRELIMINARY STORMWATER POLLUTION PREVENTION PLAN

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared in accordance with the requirements for obtaining coverage under the New York State Department of Conservation (NYSDEC) General Permit for Stormwater Discharges from Construction Activities (GP-0-20-001) for the proposed project:

NEW BILLS STADIUM

1 Bills Drive, Town of Orchard Park
Erie County, New York

SWPPP Original Date: July 31, 2022

SWPPP Revision Date: September 30, 2022

SWPPP Version: PRELIMINARY, for SEQR Review

(Current SWPPP version is not suitable for use in construction or obtaining Permit coverage)

Prepared For:



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**To be included at a later date when applicable and/or available*

Project Site Information

| | |
|--|---|
| Project Site Name: | New Bills Stadium |
| Project Location: | Town of Orchard Park and Town of Hamburg (SBLs: 161.00-5-3.1, 161.00-5-1, 161.00-5-16.1, 161.17-6-1, 161.17-6-3, 161.17-6-4.2 & 161.17-6-10) |
| City, State Zip: | Orchard Park, New York 14127 |
| County: | Erie |
| Permitted Limits of Disturbance: | 184.00 Acres |
| NYSDEC Permit Identification Number*: | To Be Determined/Assigned |
| Notice of Intent Submittal Date to NYSDEC: | To Be Determined/Submitted |

*This is a unique identifying number assigned to your project by the NYSDEC after the Notice of Intent is received.

II. Contact Information / Responsible Parties

| Owner/Operator (Permit Coverage Holder) | |
|---|---|
| Entity Name: | Buffalo Bills |
| Contact: | Kathryn D'Angelo, Assistant General Counsel |
| Address: | One Bills Drive, Orchard Park, New York 14127 |
| Phone Number: | (716) 312 - 8607 |
| E-mail: | Kathryn.d'angelo@bills.nfl.net |

| Owner's Site Manager | |
|----------------------|------------------|
| Entity Name: | To Be Determined |
| Contact: | |
| Address: | |
| Phone Number: | |
| E-mail: | |

| SWPPP Preparer | |
|----------------|---|
| Entity Name: | Pinewoods Engineering, P.C. |
| Contact: | Sara Gilbert, P.E. |
| Address: | 42 Aston Villa, North Chili, New York 14514 |
| Phone Number: | (585) 261 – 7852 |
| E-mail: | sgilbert@pinewoodseng.com |

| Regulatory Reviewer (MS4 Authority) | |
|-------------------------------------|--|
| Entity Name: | |
| Contact: | |
| Address: | |
| Phone Number: | |
| E-mail: | |

| Qualified Inspector | |
|---------------------|--|
| Entity Name: | |
| Contact: | |
| Address: | |
| Phone Number: | |
| E-mail: | |

*To be completed once assigned

| Site Contractor* | |
|------------------|--|
| Entity Name: | |
| Contact: | |
| Address: | |
| Phone Number: | |
| Emergency Phone: | |
| E-mail: | |

*All contractors and subcontractors that will be responsible for installing, constructing, repairing, replacing, inspecting and maintaining the erosion and sediment control practices or constructing the post-construction stormwater management practices **must complete the Contractor Identification and Certification in Appendix B.**

Other Important Contacts:

National Spill Response Center: 800-424-8802

NYSDEC Regional Stormwater Office:

III. SWPPP Purpose

This SWPPP has been developed to demonstrate compliance of the preliminary stormwater management mitigation measures designed for the project with Part II.B.2.c. of the New York State Department of Environmental Conservation (NYSDEC) SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-20-001 having an effective date of January 29, 2020 and an expiration date of January 28, 2025 [herein referred to as "Permit"]). Appendix E contains the Permit. Development of a SWPPP is ultimately a requirement for authorization to discharge under this Permit; however, the current SWPPP version was developed for the purposes of supporting the responses provided on the New York State Environmental Quality Review Act (SEQR) Environmental Assessment Form.

The purpose of this SWPPP is to document the selection, design, installation, implementation and maintenance of the erosion and sediment control measures and practices that will be used to meet the effluent limitations in Part I.B. of the Permit and the post-construction requirements in Part I.C. of the Permit. These effluent limitations are imposed to protect the waters of the State of New York from the adverse impacts of stormwater runoff.

IV. Project Background Information

A. Project Description

The proposed stadium is located on the west side of Abbott Road in the Town of Orchard Park, Erie County, New York and consists of several existing and proposed parking areas and internal roads. Several new parking areas, roads, sidewalks, etc. are located on the west side of Abbott Road. The existing stadium and several existing parking areas and roads are located on the east side of Abbott Roads. The existing stadium will be demolished and replaced with new parking areas. The majority of the existing parking areas will remain.

The project will enhance the existing driveway access to Big Tree Road (NYS Rt. 20A) that is currently part of Erie College Drive. A new driveway entrance is proposed to Southwestern Boulevard (NYS Rt. 20). Existing access points to Abbott Road will also be maintained.

The project is proposed to be phased with construction of the stadium and parking facilities on the west side of Abbott Road occurring first, followed by demolition of the existing stadium and establishment of parking areas on the east side of Abbott Road following in a subsequent phase.

B. Project Location

The project site is approximately 242.54 acres and consists of lands currently owned by Erie County, some of which are associated with the current stadium and some of which are associated with the SUNY Erie Community College South Campus. The site area is south of Southwestern Boulevard (NYS Rt 20) and north of Big Tree Road (NYS Rt 20A) approximately 2,500-ft west of their intersection and west of the South Branch of Smoke Creek. The parcels are mainly located in the Towns of Orchard Park and Hamburg.

The site addresses are: 1 Bills Drive and 4041 Southwestern Boulevard
Orchard Park, NY 14127 Orchard Park, NY 14127

C. Project Type

The project includes the following construction activities: ‘Sports Complexes’, ‘Road Construction’, ‘Parking Lot Construction or Reconstruction’, ‘Athletic fields (natural grass)’ and ‘Sidewalk, bike path or walking path that is part of a reconstruction project’. These activities are required to consider both erosion and sediment control measures and post-construction stormwater management. The entire project involves only stormwater and authorized non-stormwater discharges as allowed in the General Permit. The project’s construction and/or post-construction operations are not required to obtain an individual SPDES permit or another SPDES general permit.

D. Project Size

The total limits of disturbance associated with the proposed project is 181.20 acres and contains 43.66-acres of new impervious area. The project will be phased and the SWPPP accounts for the overall common plan of development related to the new stadium and associated amenity construction and the existing stadium demolition and conversion to parking area.

E. Watershed

The project has three (3) waterbodies that receive runoff from the project. The first waterbody is an unnamed tributary of Rush Creek located at the south end of the site. This tributary conveys flows in a westerly direction through Rush Creek. The second waterbody is the South Branch of Smokes Creek located east of the project. This off-site creek conveys flows in a north-westerly direction. Both creeks are located within the Lake Erie watershed. The third waterbody is Rush Creek located offsite to the west. This creek flows in a northwesterly direction to Lake Erie. According to the NYSDEC Environmental Resource Mapper, all of these Creeks are designated as Class C streams indicating that they are best used for fishing. Appendix E of the General Permit states that all of the receiving waterbodies are considered 303D impaired waterbodies. Rush Creek and it’s tributaries have nutrients as a pollutant of concern and the South Branch of Smoke Creek has both silt/sediment and nutrients as a pollutant of concern. The receiving waterbodies are not associated with class AA watersheds, watershed improvement strategy, TMDL or enhanced phosphorus removal program.

F. Site Map

Construction drawing for the project entitled “Buffalo Bills Stadium” have been prepared by Labela Associates, Watts Architecture & Engineering, and Pinewoods Engineering. These plans contain the following features required by the Permit: a general location map, total site area, all improvements, areas of disturbance, areas that will not be disturbed, existing vegetation, on-site and adjacent off-site surface waters floodplain/floodway boundaries, wetlands and drainage patterns, existing and final contours, locations of different soil types with boundaries, material, waste, borrow or equipment storage areas and locations of stormwater discharges.

G. Development Classification

The overall classification of this project used on the Notice of Intent (NOI) is ‘Redevelopment with an Increase in Impervious Area’ because it consists of a combination of new development and redevelopment areas. Under existing conditions, the project area contains impervious surfaces which will be redeveloped along with new impervious surfaces which will be constructed over existing pervious surfaces. Areas of new impervious surface over existing pervious surfaces are considered ‘New Development’ areas and remaining areas are considered redevelopment.

Impervious surfaces include all materials or structures on or above the ground surface which prevent water from infiltrating in to the underlying soils. This includes the following surfaces: paved, gravel, driveways, sidewalks, roof tops, sheds and patios.

The new development portions of the project and the redevelopment portions which have runoff directed to existing stormwater management practices which complies with the current version of the Stormwater Management Design Manual (SMDM) have been designed to comply with the following chapters of the SMDM:

- Chapter 4 – Unified Stormwater Sizing Criteria
- Chapter 5 – Green Infrastructure Practices
- Chapter 6 – Performance Criteria

The redevelopment portions of the project which do not have runoff directed to existing stormwater management practices that comply with the current version of the SMDM are eligible to have the requirements of Chapter 9 – Redevelopment Activity, of the SMDM applied because:

- The project is not located in a critical environmental area
- Redevelopment portions of the project are not being treated by an existing stormwater management practice that generally meets the criteria of one of the practices listed in the SMDM.
- The existing site contains soils with a relatively high groundwater that are not suitable for infiltration.

Table I lists the portions of the project area and impervious area that have been classified as ‘New Development’ and ‘Redevelopment’.

Table I – Project Classification

| Discharge Point | #1: Rush Creek Tributary | | #2: South Branch Smokes Creek | |
|-----------------|--------------------------|----------------------|-------------------------------|----------------------|
| | Project Area (Ac) | Impervious Area (Ac) | Project Area (Ac) | Impervious Area (Ac) |
| New Development | 16.00 | 15.94 | 17.00 | 16.62 |
| Redevelopment | 54.00 | 22.97 | 97.00 | 59.70 |
| Total | 70.00 | 38.91 | 114.00 | 76.32 |

| Discharge Point (DP) | Classification | New Development (Ac) | Redevelopment (w/ Exist. Strmwtr Mngmt) (Ac) | Redevelopment (W/Out Exist. Strmwtr Mngmt) (Ac) | Total (Ac) |
|-------------------------|-----------------|----------------------|--|---|------------|
| DP #1: Rush Creek Trib. | Project Area | 16.00 | - | 36.77 | 52.77 |
| | Impervious Area | 16.00 | - | 17.47 | 33.47 |
| DP #2: Smokes Creek | Project Area | 5.00 | - | 79.77 | 84.77 |
| | Impervious Area | 1.37 | - | 73.71 | 75.08 |
| DP #3: Rush Creek | Project Area | 13.00 | 30.66 | - | 43.66 |
| | Impervious Area | 12.75 | 9.59 | - | 22.34 |
| Total | Project Area | 34.00 | 30.66 | 116.54 | 181.20 |
| | Impervious Area | 30.12 | 9.59 | 91.18 | 130.89 |

V. General Permit Applicability & Coverage Commencement

A. Permit Coverage Applicability

This project is required to obtain coverage under the NYSDEC General Permit because it will have stormwater discharges to surface waters of the state from construction activities involving soil disturbances of one (1) or more acres, and it meets the following eligible criteria for Permit coverage;

- Work does not involve routine maintenance activity
- Construction activities described in this SWPPP have not yet commenced
- Discharges will not be mixed with non-stormwater/non-allowed sources
- The project is not required to obtain an individual SPDES Permit
- The project will not adversely affect endangered or threatened species (Refer to Section XIV.A)
- Discharge will not cause or contribute to a violation of water quality standards
- Discharge is not tributary to a state waterbody classified as AA or AA-s
- The project will not adversely affect a historic property. (Refer to Section XIV.B)

Additionally, this construction activity requires post-construction stormwater management practices because it meets the criteria of Table 2 in Appendix B of the Permit.

B. Authorization to Discharge

Construction soil disturbing activities may commence with associated stormwater discharges, and non-stormwater discharge as allowed in Part I.E.3, when all of the following criteria are met:

- It is on or after the date of (date) .
[This date is five (5) business days from the date a completed electronic version of the NOI was submitted to the NYSDEC. The completed electronic NOI included a signed MS4 Acceptance Form indicating Erie County, acting as lead agency, completed a satisfactory review pursuant to the State Environmental Quality Review Act (SEQR).]
- The following Permits are obtained: (To Be Determined) .
[Other Permit requirements to be verified]

VI. Applicable Design Standards

A. Erosion and Sedimentation Control Standards

The erosion and sediment control measures described in this SWPPP are in accordance with the New York State Standards and Specifications for Erosion and Sediment Control (Bluebook), dated November 2016.

A copy of this standard may be found at: www.dec.ny.gov/chemical/29066.html.

The Contractor is responsible for ensuring all erosion and sediment control measures and practices described in this SWPPP are implemented and maintained in compliance with this standard.

B. Post-Construction Stormwater Management Standards

The post-construction stormwater management practices have been designed to be in compliance with the performance criteria in the New York State Stormwater Management Design Manual (SMDM), dated January 2015 and the applicable sizing criteria in Part I.C.2.a.b.c. ord. of the Permit.

They have been designed by a licensed Professional Engineer (P.E.) proficient in stormwater management and treatment (see SWPPP Preparer on page 1).

The Contractor is responsible for ensuring all post-construction stormwater management practices are implemented (and maintained during construction) to be in compliance with this standard and this SWPPP when construction is complete. Permit coverage termination requires certification by a qualified individual that final construction of stormwater management practices complies with the design.

C. Local Standards

The site is located within the Towns of Orchard Park and Hamburg. Erie County is the MS4 Authority. The Towns of Orchard Park and Hamburg do not have local code requirements that exceed the requirements of the Permit.

VII. Contractor Requirements for SWPPP Documentation

A. Assembling the Complete SWPPP Document

The complete set of construction drawings and specifications are provided as separate documents; however, they should be considered an integral component of the SWPPP. The Contractor is responsible for adding the following documents as they become available or applicable to the SWPPP, in order to compose a complete SWPPP document:

1. Contractor & Sub-Contractor signed certifications to Appendix B, template in Appendix B.
2. Copies of the Trained Contractor's certifications to Appendix B.
3. The NYSDEC's Acknowledgement letter of receipt of the NOI to Appendix B.
4. All qualified inspection reports to Appendix H.
5. Compliance inspection reports, letters and communication to Appendix H.
6. The executed 5-acre waiver request to Appendix B.
7. All written requests and responses to change the frequency of inspections to Appendix H.
8. NOI updates or owner changes to Appendix B.
9. Any documentation supplementing, changing or revising the SWPPP to Appendix B.
10. When the Permit coverage is terminated the executed Notice of Termination and Stormwater Maintenance Agreement will also be part of the SWPPP and should be added to Appendix C.

B. Document Housing

A complete copy of this SWPPP, shall be kept at the construction site in a secure location accessible during normal business hours to compliance inspection personnel.

C. Document Updating

The Contractor shall mark-up, make notes in, and supplement the SWPPP with additional documentation as necessary so that at all times it accurately reflects the practices used, or intended to be used or constructed on the site. At a minimum, it is to be updated when;

- The current provisions are ineffective in meeting the Permit water quality requirements
- There is a change in the design, construction or operation that could effect the discharge of pollutants
- Issues or deficiencies are identified during a compliance inspection

D. Five (5) Acre Waiver Request Letter

Overall soil disturbance shall not exceed five (5) acres at any one time without prior written authorization from the MS4 Authority. A Five-Acre Waiver Request letter is included in Appendix B which may be used to request this authorization. If approved, the executed letter or other written authorization should be maintained in Appendix B of this SWPPP.

E. Owner Documentation at Project Termination

At the termination of the project, the Contractor is to provide the owner with a complete SWPPP Binder containing all applicable items listed above. The owner is required to retain a copy of these documents for a period of 5-years after permit coverage is terminated.

VIII. Contractor Requirements for General SWPPP Implementation

A. SWPPP Implementation

The general contractor and subcontractors performing any activity that involves soil disturbance are required to comply with the terms and conditions of this SWPPP as a condition of authorization to discharge stormwater. The provisions of this SWPPP are to be implemented from the commencement of construction activity until Permit coverage is terminated.

B. Authorized Soil Disturbance

All construction site disturbances, staging areas, etc. must be kept within the 184.00 Acre limits of disturbance shown on the construction drawings. Stormwater discharges from only this area has Permit coverage.

Should the Contractor identify additional areas outside of the coverage limits that may need to be disturbed for the project (including topsoil and soil spoil areas) they are to notify the owner as soon as possible and prior to proceeding with these activities. The Owner will notify the Contractor when all requirements have been met for extending Permit coverage to the additional area and construction in that location may commence.

Soil disturbance shall not disturb greater than five (5) acres at any one time without prior written authorization from the MS4 Authority. If soil disturbance exceeds 5-Acres at a time, the Contractor shall abide by the applicable soil stabilization requirements listed in Section XII.C and follow the Phasing Plan which defines the maximum disturbed area per phase and cut/fill requirements. Contractor is advised that disturbances exceeding 5-acres may require additional erosion and sediment control practices to protect water quality.

C. Allowed Discharge

Once Permit coverage is obtained, and all conditions for coverage are met as listed in Part II.B of the Permit, the Contractor is permitted to discharge stormwater, groundwater from dewatering per Part I.B.1.c and non-stormwater expressly authorized in Part I.E.3 & F of the Permit. Prohibited discharges listed in Part I.B.1.e are not allowed.

IX. Erosion and Sediment Control and Pollution Prevention Standards

A. Potential Sources of Pollution (Prohibited Discharges)

- Wastewater or leachate from concrete activities including washout of concrete equipment
- Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials
- Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance
- Soaps and solvents used in vehicle and equipment washing
- Toxic or hazardous substances from a spill or release
- Stormwater or snowmelt discharges mixed with sources of non-stormwater
- Sediment laden runoff from a large storm event or snow melt which would increase turbidity, suspended, colloidal or settleable solids to the receiving waterbody causing a substantial visible contrast to natural conditions, deposition or impairment of use.
- Discharges containing; residue from oil, floating substances, visible oil film, or grease.
- Non-sediment pollutants associated with general construction activity that may be stored, generated, or used on-site such as: fertilizers, pesticides, petroleum base chemicals, fuels, lubricants, sealers, paints, cleared woody vegetation, garbage, and sanitary wastes.
- Sediment laden runoff from disturbed areas, basins and impoundments

The ‘minimum temporary erosion and sediment control practices and procedures to be used during construction’ identified and described in Section XII.B are specified to prevent these potential pollutants and illicit discharges from occurring.

B. Additional Potential Sources of Pollution Identified by Contractor

If the Contractor identifies any additional activities reasonably expected to occur, or occurring at the site, which may involve pollutants or pollutant constituents that could be exposed to rainfall or snowmelt and thus have the potential to be discharged from the site, they may identify them by completing the table below

| Pollutant-Generating Activity | Pollutants or Pollutant Constituents (that could be discharged if exposed to rain/snow melt) | Location on Site & Preventive Measure (or reference SWPPP site map) |
|-------------------------------|---|--|
| | | |
| | | |
| | | |

C. Minimum Standards

The Contractor is ultimately responsible for ensuring the site at all times complies with Part I.B.1.a of the Permit for minimizing the discharge of pollutants.

X. Spill Prevention and Reporting

Hazardous Waste Management and Spill Reporting – Any hazardous or potentially hazardous waste that is brought onto the construction site will be handled properly in order to reduce the potential for storm water pollution. All materials used on this construction site will be properly stored, handled and dispensed following any applicable label directions. Material Safety Data Sheets (MSDS) information will be kept on site for any and all applicable materials.

Hazardous Properties includes: *pesticides, petroleum products, fertilizers, detergents, construction chemicals, acids, paints, paint solvents, cleaning solvents, additives for soil stabilization, concrete, curing compounds and additives and any clean water or stormwater*

Should an accidental spill occur, immediate action will be taken by the General Contractor to contain and remove the spilled material. *All hazardous materials will be disposed of by the Contractor in the manner specified by local, state, and federal regulations and by the manufacturer of such products.* As soon as possible, the spill will be reported to the appropriate state and local agencies. As required under the provisions of the Clean Water Act, any spill or discharge entering the waters of the United States will be properly reported.

Any spills of hazardous materials in quantities in excess of Reportable Quantities as defined by EPA or the State Agency regulations, shall be immediately reported to:

- EPA National Response Center : **1-800-424-8802**
- NYSDEC Div. of Environmental Remediation (NYS Spill Hotline): **1-800-457-7362**

The reportable quantity for petroleum products is 5-gal. Refer to Exhibit 1.1-1 of the NYSDEC Division of Environmental Remediation Technical Field Guidance Spill Reporting and Initial Notification Requirements for hazardous materials spill reportable quantities and procedures.

A. Minimum Spill Prevention Procedures

- All materials with hazardous properties must be stored in a secure and covered location when not in use
- Store the minimum practical quantity of hazardous materials at the job site and schedule deliveries as close to the time of use as practical
- All products should be stored in, and used from, the original container with the original product label.
- All products are to be used in strict compliance with the product label.
- Maintain a spill control and containment kit at the storage site.
- All of the product should be used before disposing of container. Dispose of containers and wash water in compliance with regulations. Wash water is not allowed to mix with stormwater.
- Dispose of excess product and containers in strict compliance with product labels and state and federal regulations.

B. Spill Containment Kit

A spill containment kit may contain absorbents such as; kitty litter or sawdust, acid neutralizing agent, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.

XI. Project Soils

According to the NRCS Web Soil Survey, the following soil types and hydrologic groups are present within the project area of disturbance;

Table II – Soil Types

| Soil Symbol, Name, % Slope Range | Hydrologic Group (HSG) | Texture | Drainage Character | Erosion Hazard Potential* | Depth to Restrictive Feature | Depth to Water Table | % of Project |
|--|------------------------|--|------------------------------|---------------------------|--------------------------------|----------------------|--------------|
| Angola silt loam, AoA, 0-3% | D | Silty clay/channery loam followed by weathered bedrock | Somewhat Poorly Drained | Slight | 20-40 Inches to Lithic Bedrock | 6-18 Inches | 25% |
| Angola silt loam, AoB, 3-8% | | | | | | | 14% |
| Darien silt loam, DbA, 0-3% | C/D | Silty/channery clay loam | Somewhat Poorly Drained | Slight | More Than 80 Inches | 6-12 Inches | 29% |
| Fluvaquents and Udifluents, Fu | A/D | Gravelly silt loam/sand | Very Poorly Drained | Slight | More Than 80 Inches | 0-12 Inches | 1% |
| Illion silt loam, In | C/D | Silty/channery clay loam | Poorly Drained | Slight | More Than 80 Inches | 0-12 Inches | 7% |
| Manlius channery silt loam, MaB, 3-8% | C | Channery silt loam followed by unweathered bedrock | Somewhat excessively drained | Moderate | 20-40 Inches to Lithic Bedrock | More Than 80 Inches | 9% |
| Manlius channery silt loam, MaC, 8-15% | | | | | | | 3% |
| Marilla channery silt loam, MfA, 0-3% | D | Channery silt loam | Moderately Well Drained | Slight | 15-30 Inches to Fragipan | 18-24 Inches | 11% |
| Pits, borrow, Pt | - | - | - | - | - | - | 1% |

**Erosion hazard potential is the probability that the combination of soil cohesiveness, particle size and site slope will generate a significant amount of soil loss. Other erosion factors such as slope length, rainfall intensity and duration are not accounted for in this rating. Even sites with a low erosion risk can have a high risk to water quality when located close to a water resource.*

A copy of the NRCS Soil Map may be found in Appendix G.

Erosion hazard potential is the probability that the combination of soil cohesiveness, particle size and site slope will generate a significant amount of soil loss. Other erosion factors such as slope

length, rainfall intensity and duration are not accounted for in this rating. Even sites with a low erosion risk can have a high risk to water quality when located close to a water resource.

Since the site has been previously developed, existing on-site soils may include imported fill or compacted soils that differ in type or properties than those listed in the NRCS soil study. The study generally indicates that the on-site soils are not suitable for large-scale infiltration practices due to mainly clay, poorly draining soils, along with shallow bedrock and groundwater table depth.

A subsurface geotechnical investigation and evaluation was conducted by McMahan & Mann Consulting Engineering and Geology, P.C. and documented in a Subsurface Exploration Table and Boring Location Map dated 5/18/22. The portion of the study completed and documented in the table included 34 borings and 17 groundwater monitoring wells. To date, most of the subsurface exploration has been completed in the vicinity of the proposed stadium footprint and not evenly dispersed across the site or in the location of proposed stormwater management facilities. The information available provides information on the depth to bedrock and groundwater and shows significant variation in depths across the investigated area. Refer to Section XIV.G for further discussion on groundwater and bedrock depths.

XII. Temporary BMPs to be Used During Construction

A. Site Map

The 'Buffalo Bills Stadium Plans' construction drawings prepared by Labella and Pinewoods Engineering include Erosion and Sediment Control Plans and Details that detail the: specific locations, size, dimensions, material specifications, and installation details for each Best Management Practice (BMP) specified in this SWPPP.

B. Temporary Erosion and Sediment Control Best Management Practices (BMP's) to be Used During Construction

The following minimum erosion and sediment control BMP's are specified for use on this project.

Table III – BMP's

| Practice | Bluebook Specification Pg | Operation & Maintenance Requirements | Maintenance Inspection Schedule |
|---|---------------------------|---|--|
| Protecting Vegetation During Construction | 2.26 | Perform maintenance on fence as needed. | Inspect daily for maintenance and compliance with procedures |
| Concrete Truck Washout | 2.24 | Pump excess rainwater accumulated over hardened concrete to stabilized filter strip Remove accumulated hardened material when 75% of storage capacity is filled. Excess wash water shall be pumped in a containment vessel and properly disposed of offsite. Dispose of hardened material offsite | Inspect practice daily for maintenance or leaks Inspect site daily for concrete discharges in non-designated areas. |

| | | | |
|--------------------------------|----------|--|--|
| | | in a construction/demolition landfill. Repair and replace plastic liner as needed and with each cleaning. | |
| Stabilized Construction Access | 2.30 | Top dress with additional aggregate as needed. Remove all sediment spilled, dropped or washed outside of permitted area immediately. When necessary, clean wheels prior to leaving site. Washwater to drain to sediment trapping device. | Inspect access points outside of permitted area daily for track-out. Inspect practice daily for maintenance and effectiveness. |
| Silt Fence | 5.54 | Remove sediment accumulated behind fence as needed and when bulges appear. Replace sections of fence as needed. Secure posts, re-fasten cloth and re-embed cloth into ground as needed. | Inspect daily for maintenance and after storm events |
| Storm Drain Inlet Protection | 5.57 | Repair/Replace as necessary so installation conforms with specifications. Remove accumulated sediment as needed. | Inspect daily for maintenance and after storm events |
| Check Dam | 3.2 | Remove sediment accumulated behind dam as needed. Install additional dams if erosion occurs between structures. | Inspect practice after each runoff event |
| Dewatering Sump Pit | 3.7/5.16 | | |
| Construction Ditch | 3.4 | Remove accumulated sediment. Check berm is secure. Avoid traffic over ditch. | Inspect daily for maintenance and after storm events |
| Rock Outlet Protection | 3.39 | Repair as necessary so practice is in compliance with design detail. | Inspect after high flow for evidence of scour beneath the riprap or for dislodged rocks |
| Temporary Seeding | 4.58 | Water as necessary. Repair drainage trenches and reseed bare areas. | Inspect daily for maintenance and after storm events |
| Filter Sock | 5.7 | Do not permit traffic to cross. Remove accumulated sediment when it reaches half the above ground height of the sock and disposed of accordingly. Repair or replace damaged socks in accordance with manufacture's recommendations and/or within 24-hrs of inspection. | Inspect weekly and after each runoff event. |

| | | | |
|----------------------|------|--|---|
| Sediment Trap | 5.46 | Remove accumulated sediment from bottom when it reaches a depth of 12-inches. Pump down water through appropriate means before anticipated storm event. Refer to Appendix D for design of Sediment Traps | Inspect before anticipated storm events for adequate capacity and after storm events for maintenance. |
| Winter Stabilization | 2.38 | Repair any facilities damaged by snow or other means. Re-stabilize any bare or eroded areas. | Inspect after large snow events or anticipated melt-off events. |
| Soil Restoration | 4.52 | Area is to be kept free of vehicular and foot traffic or other weight loads. | Inspect daily to ensure proper procedures for area are followed. |

C. Stabilization Plans

The following stabilization plans are to be used during various phases of the project. Refer to Section XIII.A for a list of specific construction activities and associated Stabilization Plans that should be used during those activities.

- **Plan I** – To the greatest extent possible, phase soil disturbance activities so only those areas actively being worked are disturbed. Use Plan II for stabilization when complete. or for in-active areas.
- **Plan II** – For any areas that have been temporary disturbed from construction activities: provide a temporary vegetative cover through temporary seeding performed in accordance with the bluebook specification “Temporary Construction Seeding” on page 4.58. Where a temporary construction area planting mix is not specified on the Landscaping or Construction Drawings, use the following:
 For spring, summer or early fall; seed the area with ryegrass (annual or perennial) at 30lbs per acre. For late fall or early winter, then seed Certified ‘Aroostook’ winter rye (ceral rye) at 100 lbs per acre. Mulch the area with hay or straw at 2 tons per acre. Anchor mulch where required.
- **Plan III** – For any areas that have been disturbed from construction activities use one of the methods below:
 1. *For proposed impervious and gravel areas:* Permanently stabilize with a minimum depth of 6-inches of well-compacted clean subbase or gravel.
 2. *For proposed permanent vegetative waterways/bioretenion areas/pond areas:* provide a permanent vegetative cover through permanent seeding performed in accordance with the bluebook specification ‘Vegetative Waterways’ on page 4.78. Use the planting mix specified in the Construction Drawings.
 3. *For proposed landscape areas:* permanently stabilize using either vegetative or landscape hardscape cover in accordance with the Construction Drawings. Stabilization to be performed in compliance with the bluebook specification “Trees, Shrubs and Vines”, page 4.63.
 4. *For proposed lawn areas:* Establish permanent grasses with other forbs and/or shrubs to provide a minimum uniform 80% perennial vegetative cover on areas disturbed by construction. Prior to seeding, perform soil restoration in accordance with soil restoration BMP requirements. Comply with ‘Permanent Construction Area Planting’ and ‘Recreation Area Seeding’ in Bluebook, pages 4.42 & 4.45. Use permanent construction area planting mix

specified on the Construction Drawings.

Follow bluebook specification for site preparation, liming, fertilizing, planting, protecting and maintaining. Follow bluebook specification for topsoiling on page 4.59.

- **Plan IV** – When permanent stabilization has reached a uniform density of 80% across all pervious areas, notify the owner. A final Qualified Inspection will be required so the Notice of Termination may be filed. When notified by the owner or owner’s representative; remove temporary sediment control practices and restore lawn to original condition.

D. Temporary Erosion and Sediment Control Procedures to be Used on a continual (as-needed) basis During Construction

Table V – Best Management Procedures lists erosion and sediment control procedures that are included in the SWPPP design and should be used on a continual (and as-needed) basis during all construction activities.

Table IV – Best Management Procedures

| Practice | Description | Procedure & Implementation | Maintenance |
|----------------------------------|--|--|---|
| Track-Out | Minimize the track-out of sediment onto streets or paved areas from vehicles existing the site. | Implement as necessary and perform daily inspection to monitor track-out. Remove by sweeping, shoveling, vacuuming or other effective measures. Hosing or sweeping sediment into a non-sediment trapping practice (ie. inlet) is prohibited. | Remove deposited sediment by the end of the same work day in which it occurred or by the end of the next work day if it occurs on a non-work day. |
| Dewatering | Permit compliance requirements for the discharge of stormwater removed from excavations, trenches, foundations, vaults, etc. | Only clean water, not mixed with cleaning solvents, fertilizer, or other pollutants may be allowed to discharge in a non-erosive manner. | Monitor for compliance. |
| Topsoil & Soil Stockpile Control | Controls to minimize discharge of sediment from soil stockpiles. | Install silt fence around stockpiles, minimum 10’ from toe of slope. Locate stockpile away from or upstream of drainage flows. Temporary seed stockpiles. | Reseed bare areas in temporary stabilization, maintain surrounding silt fence. Hosing or sweeping sediment to a non-sediment trapping practice (ie. inlet) is prohibited. |
| Dust Control | Control surface and air movement of dust resulting from disturbed soil surfaced. | Implement dust control as needed, during dry conditions and periods of large, open disturbance. | Maintain vegetated buffer areas as long as possible and phase construction to minimize disturbed areas at a time. Use a control method that will not degrade the water quality of waters in the vicinity. |
| Soil Compaction | Controls to minimize compaction through the restriction of vehicle or equipment access across | Delineate areas where future infiltration practices will be located with flagging. Create vehicle routes within site that | To the greatest extent possible for grading, keep construction vehicles from traveling across non- |

| | | | |
|--|--|--|--|
| | areas where final vegetative stabilization will occur or infiltration practices will be installed. | align with future impervious areas. | compaction areas. Repair compacted areas as necessary by following soil restoration steps on plans. |
| Equipment and Vehicle Washing | Compliance for equipment and vehicle washing discharge | Soaps, detergents and solvents used for equipment and vehicle cleaning are not permitted to be discharged. Clean water may be used for equipment and vehicle washing, wheel wash water and other wash waters and allowed to discharge only if used in conjunction with a BMP to capture sediments and pollutants prior to discharge. | Monitor for compliance |
| Storage, Handling & Disposal of Products, Materials and Wastes | Procedures for preventing potentially pollutant materials on-site from mixing with, or contaminating stormwater including: pesticides, herbicides, insecticides, fertilizers, landscape and building materials, construction and domestic waste, and sanitary wastes | Identify potential pollutants onsite and cover to protect from stormwater exposure and potential for runoff. | Monitor for compliance <i>For Spill Prevention & Response procedures refer to later portion of this report.</i> |
| Pollutant & Chemical Treatment Control | Controls to identify and control any treatment chemicals or pollutants which may be or are used at the site. | Complete the Pollutant Identification Sheet included in Appendix B for chemicals and pollutants which can reasonably be expected to be used or stored at the site | Update the Pollutant Identification Sheet in Appendix B during construction if additional chemicals or pollutants are identified as needed. Follow all product specifications for storage, use and disposal. |

E. Maintenance Inspections – Contractor

A Trained Contractor must inspect the erosion and sediment control practices and pollution prevention measures being implemented within the active work area daily to ensure that they are being implemented within the active work area daily to ensure that they are being maintained in effective operating condition at all times. If deficiencies are identified, the contractor shall begin implementing corrective actions within one business day and shall complete the corrective actions in a reasonable time frame.

- Temporary Suspension: For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) **and temporary stabilization measures have been applied to all disturbed areas**, the trained contractor can stop conducting the maintenance inspections. The contractor shall resume inspections as soon as soil disturbance activities resume.
- Partial Completions: For construction sites where soil disturbance activities have been shut down with partial project completion, the trained contractor can stop conducting the inspections if **all areas disturbed as of the project shutdown date have achieved final stabilization and all post-**

construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational

F. Qualified Inspections

The Permit requires the owner/operator to have a qualified professional conduct an assessment of the site prior to commencement of construction and certify in an inspection report that the appropriate erosion and sediment controls described within the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction. After the initial inspection, subsequent Qualified Inspections are to occur within the following timeframe:

- Construction is on-going (*disturbance is irreverent because of discharge to 303d waterbody*): Two inspection every seven days spaced by a minimum of two days.
- Temporary Suspension of Soil Disturbance Activities: Once every 30 days (Regional Office Stormwater Contact Person must first be notified in writing prior to reducing frequency of inspections)
- Partial Completion Shut-Down: Not required (Regional Office Stormwater Contact Person must first be notified in writing prior to reducing frequency of inspections). If soil disturbance activities are not resumed within 2 years from the date of shutdown, the owner or operator shall have the qualified inspector perform a final inspection and certify that all disturbed areas have achieved final stabilization.

These Qualified Inspections are in-addition to the Trained Contractor Inspections. The Contractor shall make the hard copy of the SWPPP which is maintained at the construction site available to the Qualified Inspector for review at the first inspection. The Contractor will be provided with an electronic copy of the inspection report within one business day of the Qualified Inspection. The Contractor is responsible for completing any action items noted in that report within one-business day of receipt. The Contractor is also responsible for placing a copy of the inspection report in Appendix H of this SWPPP. If the individual or entity completing the Qualified Inspections differs from the SWPPP Preparer, than the Contractor shall ensure that the SWPPP Preparer is also provided an electronic copy of all Qualified Inspection Reports.

G. Maintenance Requirements Prior to Turning Over Post-Construction Stormwater Management Facilities to Owner

All post-construction stormwater management facilities shall fully comply with all design requirements and specifications in the Construction Drawings and SWPPP prior to being turned over to the owner. Filing of the Notice of Termination to end permit coverage requires an inspection and certification as such. Since these facilities may be temporarily used to convey or control sediment-laden stormwater runoff during construction they may need to be maintained prior to turning over to the owner. Table VI lists maintenance requirements for post-construction stormwater management facilities prior to turning over to the owner.

Table V – Post-Construction Stormwater Management Maintenance Requirements Following Construction Completion

| Facility | Requirements |
|---|--|
| Bioretention Facilities, Ponds, Forebays & Deep Pools | Ensure final construction complies with all design requirements and specifications in the Site Plans and SWPPP. If necessary, remove accumulated silt in pond or pre-treatment areas. Ensure there are no bare or eroded areas and rip-rap spillway is clean without any trenches or eroded areas. |
| Swales & Outlet Structures | Ensure final construction complies with all design requirements and specifications in the Site Plans and SWPPP. If necessary, remove accumulated silt in swale. Ensure outlet structure and piping is clean of sediment and any bare areas are replanted if necessary. Ensure there are no bare or eroded areas and rip-rap emergency spillway is clean. |
| Rip-Rap Outlet Protection | Ensure final construction complies with all design requirements and specifications in the Site Plans and SWPPP. Stone to be dense and secured for adequate velocity mitigation. |
| Storm Sewer Structures, underground detention chambers, water quality units and Pipes | Ensure structures, chambers and pipes are free of sediment and debris. |

XIII. Construction Phasing

The following Sequence of Construction Activities is a suggested phasing sequence of major construction activities and associated the minimum erosion and sediment control practices to be installed for each activity resulting in soil disturbance. This list indicates when each erosion and sediment control practice should be installed and when it should be removed. While in-place, each practice should be inspected and maintained as described in Section XII.B.

A. Sequence of Construction Activities

Table VI – BMP’s Associated with Construction Activities

| Construction Activity | BMP’s to be Implemented Prior to Activity Commencing* | BMP’s to be Implemented and/or Maintained During Activity | Soil Stabilization Plan to be Used During Activity (Ref. XII.C) |
|---|---|---|---|
| Prepare staging and operations area (ie. Trailers, parking and storage areas, temporary fencing, sanitation facilities, etc.) | -Protecting Vegetation During Construction -Stabilized Construction Entrance -Silt Fence/Silt Sock -Inlet Protection | -Stabilized Construction Entrance -Silt Fence/Silt Sock -Inlet Protection | Plan I |

| | | | |
|--|--|---|----------|
| Demolition, clearing and grubbing | -Stabilized Construction Entrance -Silt Fence/Silt Sock -Inlet Protection | -Stabilized Construction Entrance -Silt Fence/Silt Sock -Inlet Protection | Plan I |
| Excavation, topsoil stripping and rough grading | -Stabilized Construction Entrance -Silt Fence/Silt Sock -Inlet Protection -Construction Ditch -Check Dam -Sediment Trap/Basin | -Stabilized Construction Entrance -Silt Fence/Silt Sock -Inlet Protection -Construction Ditch -Check Dam -Sediment Trap/Basin | Plan II |
| Utility Installation | -Stabilized Construction Entrance -Silt Fence/Silt Sock -Inlet Protection -Construction Ditch -Check Dam -Sediment Trap/Basin -Rock Outlet Protection -Concrete Washout | -Stabilized Construction Entrance -Silt Fence/Silt Sock -Inlet Protection -Construction Ditch -Check Dam -Sediment Trap/Basin -Rock Outlet Protection -Concrete Washout | Plan II |
| Stadium foundation and Infrastructure construction | -Stabilized Construction Entrance -Silt Fence/Silt Sock -Inlet Protection -Construction Ditch -Check Dam -Sediment Trap/Basin -Rock Outlet Protection -Concrete Washout | -Stabilized Construction Entrance -Silt Fence/Silt Sock -Inlet Protection -Construction Ditch -Check Dam -Sediment Trap/Basin -Rock Outlet Protection -Dewatering -Concrete Washout | Plan II |
| Fine Grading, curbing and pavement construction | -Stabilized Construction Entrance -Silt Fence/Silt Sock -Inlet Protection -Construction Ditch -Check Dam -Sediment Trap/Basin -Rock Outlet Protection -Concrete Washout | -Stabilized Construction Entrance -Silt Fence/Silt Sock -Inlet Protection -Construction Ditch -Check Dam -Sediment Trap/Basin -Rock Outlet Protection -Concrete Washout | Plan II |
| Finalize Post-Construction Stormwater Management Facilities, Perform Soil Restoration and Landscaping Installation | -Silt Fence/Silt Sock -Inlet Protection -Rock Outlet Protection | -Silt Fence/Silt Sock -Inlet Protection -Rock Outlet Protection | Plan III |
| Punchlist Items and Project Close-Out | N/A | -Stabilization | Plan IV |

**Temporary Erosion and Sediment Control Policies to be used on a continual (as-needed) basis listed in Section XII.C are assumed to be provided as required during all construction activities.*

XIV. Site Planning and Design

Preservation of natural features includes techniques to identify and preserve natural areas that can be used to protect water, habitat and vegetative resources. Conservation includes designing elements of the development in a way that the site design takes advantage of a site's natural features, preserves sensitive areas and identifies constraints and opportunities to prevent or reduce negative effects of a development. The potential environmental impacts associated with the project are being analyzed as part of the New York State Environmental Quality Review Act process. Where necessary potential impacts will be mitigated to the greatest extent possible by the design of the project and in compliance with the Permit (GP 0-20-001) requirements.

XV. Existing Drainage Conditions

The site topography generally is elevated in the central portion of the site, Abbott Road transects the project area in a north-south direction at the approximately mid-point laterally of the site. The eastern portion of the site, generally east of Abbott Road generally slopes in a north-easterly/easterly direction towards Smokes Creek and Southwestern Boulevard. The southern portion of the site, generally west of Abbott Road slopes in a southwesterly direction towards Rush Creek tributary and Big Tree Road. The north/west portion of the site generally slopes to the north and westerly direction towards Southwestern Boulevard and the west.

Generally, drainage on the south-west side of Abbott Road flows south-westerly and eventually reaches the Rush Creek tributary mainly through private on-site storm sewer systems. This includes Erie Community College (ECC) parking areas on the south side of the campus. Portions of the private collection system discharge directly to the Creek, this area is considered drainage subarea #1A-I. Portions of the private collection system are discharged to an existing stormwater management basin, which does not comply with the current SMDM standards, and then to Rush Creek tributary, this area is considered drainage subarea #1A-II.

The majority of the drainage on the east side of Abbott Road (north and south) including the existing stadium drainage and groundwater collection system is collected in a private on-site storm sewer system and conveyed to Smokes Creek through several different sewers and discharge points, this area is considered drainage subarea #2A. Additionally, there is a significant portion of existing parking areas on the west side of Abbott Road that is also collected in a private on-site storm sewer system and conveyed to Smokes Creek which is also part of drainage subarea #2A. On the north-west side of Abbott Road, runoff flows north and is intercepted in the storm sewer system within the Southwestern Boulevard right-of-way, this area is considered drainage subarea #2B. Small portions of the drainage to the right-of-way are via onsite connected basins. The storm sewer system along Southwestern Boulevard east of the Abbott Road intersection conveys drainage to the South Branch of Smokes Creek.

The existing ECC campus buildings and the parking areas to the north, west and southwest have private on-site storm sewer systems that convey drainage in a westerly direction to an existing stormwater management pond. This practice appears to comply with current SMDM standards. According to record drawings, the pond has an outlet that connects to a storm sewer system in Southwestern Boulevard that conveys flows in a westerly direction to Rush Creek. This area is

considered drainage subarea #3A. Mainly lawn areas on the north side of the ECC campus and one small storm sewer connection to Abbott Road and Southwestern Boulevard have runoff which is collected in the Southwestern Boulevard storm sewer system that is associated with State Route 20 and owned by the New York State Department of Transportation (NYSDOT). This portion of sewer in the state right-of-way, and west of the Abbott Road intersection, conveys runoff in a westerly direction to the same existing stormwater pond that eventually outlets to Rush Creek.

There are not any significant areas of offsite stormwater run-on to the project area. Small portions of the Erie Community campus lawn, patio and sidewalk areas on the western end of the project sheet flow onto the site.

Existing portions of the site located within the project limits of disturbance, or draining to the primary project drainage or stormwater points for these projects, were included in the existing conditions hydrologic analysis and used to establish the existing conditions peak runoff rates for the 1-year, 10-year, 25-year and 100-year storm events.

The existing project area has three (3) separate receiving waterbodies of project runoff, considered discharge points.

- Discharge Point #1 is the unnamed tributary of Rush Creek on the south end of the site. Runoff from the project reaches this discharge point via two (2) runoff points which have been divided into subareas. Discharge Point #1 has the following associated subareas;
 1. Drainage Area #1A-I flows in a southwesterly direction and directly discharges to Rush Creek tributary.
 2. Drainage Area #1A-II flows in a southwesterly direction and discharges to an existing basin with an outlet to Rush Creek tributary. The existing basin was modeled in the hydrologic analysis using the topographic contours from 742.60 to 751.00 ft. 85-ft of 36-inch diameter pipe storage at 2.6%, with invert elevation at 743.80-ft was also modeled for storage. The outlet components were taken from the survey and included:
 - A primary 30-inch diameter outlet pipe, 105- ft long at 0.19% slope with an invert elevation of 742.09
 - An upstream culvert routed to the primary culvert consisting of a 15-inch diameter pipe, 25-ft long at 1.44% slope with an invert elevation of 742.98
 - A 24" square inlet with a horizontal top of grate elevation at 750.84-ft and routed to the primary outlet pipe.
 - A 10-ft wide spillway at elevation 750.00-ft.
- Discharge Point #2 is the South Branch of Smokes Creek just beyond the eastern boundary of the site. Runoff from the project reaches this discharge point via two (2) runoff points which have been divided into subareas. Discharge Point #2 has the following associated subareas;
 1. Drainage Area 2A – is collected in a private onsite storm sewer system at various locations and is conveyed by storm piping to the creek.
 2. Drainage Area 2B – is collected in the Southwestern Boulevard storm sewer system at various locations. Some runoff reaches this through overland sheet flow, some through direct inlet connections and some is conveyed to the right-of-way via swale and then an inlet and storm pipe connection convey it to the public system. The public storm sewer system is believed to flow in an easterly direction and discharge to Smokes Creek.

- Drainage Area #3 is the existing stormwater pond located offsite to the west with an outlet to the Rush Creek waterbody. Runoff from the project reaches this discharge point via two (2) runoff points which have been divided into subareas. Discharge Point #3 has the following associated subareas;
 1. Drainage Area 3A – consists of the existing ECC campus and is collected in a private onsite storm sewer system at various locations and is conveyed by storm piping to an existing stormwater management pond. An outlet structure from this pond directs flows in the SR 20 storm sewer westerly to the outlet at Rush Creek.
 2. Drainage Area 3B – consists of mainly lawn areas from ECC campus that drain to the NYSDOT storm sewer system in Southwestern Boulevard (SR 20). The portion of this system west of the Abbott Road intersection conveys flows in a westerly direction to an existing stormwater management pond. An outlet structure from this pond directs flows in the SR 20 storm sewer westerly to the outlet at Rush Creek.

Refer to the ‘Existing Conditions Drainage Area Map’ in Appendix A for a map showing existing catchment boundaries, flow paths and design points. Table VII provides a summary of these areas.

Table VII – Existing Conditions Drainage Area Summary

| Discharge Point | Drainage Area | Area (Ac) | CN | Tc (min) | Peak Runoff Rate (cfs) | | | |
|-----------------|---------------------------|--------------|----|----------|------------------------|---------------|---------------|---------------|
| | | | | | 1-Yr Storm | 10-Yr Storm | 25-Yr Storm | 100-Yr Storm |
| DP #1 | DA #1A-I | 52.30 | 86 | 40.5 | 25.97 | 66.30 | 90.00 | 137.05 |
| | DA #1A-II | 17.15 | 92 | 7.2 | 31.15 | 63.18 | 80.77 | 114.68 |
| | Pond Outflow (ExP) | - | - | - | 10.79 | 14.05 | 21.50 | 75.03 |
| | DA #1 Total (DP-1) | 69.45 | - | - | 35.65 | 80.09 | 106.13 | 162.21 |
| DP #2 | DA #2A | 73.41 | 95 | 21.6 | 101.79 | 192.53 | 241.86 | 336.92 |
| | 2A Reach | - | - | 6.9 | 100.78 | 190.66 | 239.52 | 333.68 |
| | DA #2B | 1.84 | 96 | 28.1 | 2.31 | 4.26 | 5.32 | 7.36 |
| | 2B Reach | - | - | 8.0 | 2.29 | 4.23 | 5.28 | 7.31 |
| | DA #2 Total (DP-2) | 75.25 | - | - | 102.83 | 194.44 | 224.25 | 340.23 |
| DP #3 | DA #3A | 28.77 | 86 | 39.4 | 14.57 | 37.13 | 50.40 | 76.73 |
| | 3A Reach | - | - | 3.7 | 14.53 | 37.04 | 50.27 | 76.53 |
| | DA #3B | 22.53 | 84 | 35.1 | 10.44 | 28.71 | 39.69 | 61.73 |
| | 3B Reach | - | - | 8.6 | 10.42 | 28.64 | 39.59 | 61.57 |
| | DA #3 Total (DP-3) | 51.30 | - | - | 24.90 | 65.53 | 89.66 | 137.79 |
| Total | DA Total (ET) | 196.00 | - | - | 154.04 | 319.89 | 415.86 | 607.60 |

XVI. Proposed Drainage Conditions

The proposed improvements have been designed to meet local and state jurisdictional requirements which are intended to result in a negligible or beneficial impact on downstream drainage conditions as compared with existing conditions. The proposed hydrology has been designed to closely match existing conditions and re-use existing storm conveyance infrastructure to the greatest extent possible.

A portion of the drainage on the south-west side of Abbott Road will continue to be collected in a storm sewer system and discharged directly to the Rush Creek tributary utilizing the existing storm sewer piping, this area is considered drainage subarea #1A-I. The existing stormwater basin will be redeveloped into a standard practice wet pond, denoted as P-1. The wet pond will provide water quality volume, channel protection volume, and peak runoff rate attenuation. The pond will utilize existing storm sewer piping to discharge to the Rush Creek tributary. The area that is conveyed directly to this pond is considered drainage subarea #1A-II. Four (4) bioretention facilities are proposed on the south-west side of Abbott Road to collect drainage from the majority of the new parking areas. Runoff to bioretention facility #1 (B-1) is associated with drainage subarea #1A-III; runoff to bioretention facility #2 (B-2) is associated with drainage subarea #1A-IV; runoff to bioretention facility #3 (B-3) is associated with drainage subarea #1A-V; and runoff to bioretention facility #4 (B-4) is associated with drainage subarea #1A-VI. The bioretention facilities are considered a standard/green practice and provide Runoff Reduction Volume and Water Quality Volume. They are designed to discharge to the existing storm sewer system that, with proposed modifications, will discharge to the wet pond (P-1) and ultimately the Rush Creek tributary.

The majority of the drainage on the east side of Abbott Road and a portion of the drainage from new parking areas on the west side of Abbott Road north of the new stadium will continue to be collected in a private on-site storm sewer system, utilizing existing components to the greatest extent possible, this area is considered drainage subarea #2A-I. The storm sewer system will be modified to route portions through a hydrodynamic water quality unit prior to discharge to Smokes Creek at approximately the same outlet points as existing conditions. A new bioretention facility #6 (B-6) is proposed to treat a small portion of runoff from an existing parking area, this facility is associated with drainage subarea #2A-II. The new stadium footprint is associated with drainage subarea #2B and will have an internal system for collecting roof and field runoff along with a groundwater collection system. This system will be directed to a hydrodynamic water quality unit before it is conveyed to Smokes Creek. A portion of the drainage from the existing parking areas east of Abbott Road and north and east of the existing stadium will continue to be collected in a private storm sewer system and discharged to Smokes Creek at existing outlet points, this area is considered drainage subarea #2C. The existing stadium has a runoff and groundwater drainage pipe that discharge to Smokes Creek. After the stadium is removed, this area will be resurfaced and is designed to be collected in a storm sewer system with a hydrodynamic unit located at the outlet prior to discharge. That system will also include a bypass which during high-flows from less frequent storm events, larger volumes of runoff will be directed to an underground chamber detention storage system which will serve to attenuate peak discharge rates. This area is associated with drainage subarea #2D.

Runoff from portions of the existing parking areas to the west and north of ECC campus will continue to be collected in a private storm sewer system and directed to the existing standard-practice stormwater management pond located offsite to the west. This area is considered drainage subarea

#3A-I. Runoff from new parking areas on the east side of the ECC campus will be collected in a private storm sewer system. That system will contain a bypass which will direct some of the flows to a bioretention facility #5 (B-5) and the remaining flows to a new standard practice wet pond (P-2). The area directed to the bypass structure is drainage subarea #3A-II. Areas which are not directed to the bypass structure and instead are drained directly to the stormwater pond (P-2) are associated with drainage subarea #3A-III. A portion of the lawn areas on the north side of ECC will continue to sheet drain to the north to Southwestern Boulevard and ultimately through the NYSDOT storm sewer system to the existing offsite stormwater pond. This area is associated with drainage subarea #3B. The existing offsite stormwater pond maintains an outlet structure that discharges to the Southwestern Boulevard storm sewer system west of the pond and eventually discharges to Rush Creek.

There are not any significant areas of offsite stormwater run-on to the project area under proposed conditions. Small portions of the ECC campus lawn, patio and sidewalk areas on the western end of the project sheet flow onto the site.

Portions of the site located within the project limits of disturbance, or draining to the primary project drainage or stormwater points for these projects, were included in the proposed conditions hydrologic analysis and used to establish the existing conditions peak runoff rates for the 1-year, 10-year, 25-year and 100-year storm events.

The proposed project area has the same three (3) separate receiving waterbodies of project runoff, considered discharge points as existing conditions; a summary of these are:

- Discharge Point #1 is the unnamed tributary of Rush Creek on the south end of the site. Runoff from the project reaches this discharge point via two (2) runoff points which have been divided into subareas. Discharge Point #1 has the following associated subareas;
 1. Drainage Area #1A-I flows in a southwesterly direction and directly discharges to Rush Creek tributary.
 2. Drainage Area #1A-II flows in a southwesterly direction and receives runoff from upstream drainage areas #1A-III through #1A-VI. This area discharges from the wet pond P-1 to the existing storm sewer outlet point to Rush Creek tributary.
- Discharge Point #2 is the South Branch of Smokes Creek just beyond the eastern boundary of the site. Runoff from the project reaches this discharge point via four (4) runoff points which have been divided into subareas. Discharge Point #2 has the following associated subareas;
 1. Drainage Area 2A – is collected in a private onsite storm sewer system at various locations and portions are conveyed by storm piping to stormwater management practices associated with drainage areas #2A-I and 2A-II and then to the creek.
 2. Drainage Area 2B – is the new stadium collection system which is conveyed first to an internal hydrodynamic unit and then to the creek.
 3. Drainage Area 2C – is both sheet drained and collected in private onsite storm sewer systems that discharge at various locations via existing sewers to the creek.
 4. Drainage Area 2D – is the pavement area which will replace the existing stadium when removed, this area is conveyed to a hydrodynamic unit and portions of the runoff to an underground chamber detention system before discharge to the creek.
- Discharge Point #3 is the existing offsite stormwater management pond located west of ECC

campus and the storm sewer system in Southwestern Boulevard which conveys drainage to Rush Creek. Runoff from the project reaches this discharge point via two (2) runoff points which have been divided into subareas. Discharge Point #3 has the following associated subareas;

1. Drainage Area 3A – is collected in a private onsite storm sewer system at various locations and portions are conveyed by storm piping to the existing storm piping on the ECC campus and to the existing offsite stormwater pond. Runoff collected in this system and discharge in the offsite pond is associated with drainage area #3A-I. Runoff which is first directed to an onsite stormwater management practice prior to discharge to the offsite pond is associated with drainage areas #3A-II and 3A-III.
2. Drainage Area 3B – is the lawn areas on the north end of the site that continue to sheet flow to the north and are collected in the Southwestern Boulevard storm sewer system that conveys flows to the west to the existing offsite pond.

Refer to the ‘Proposed Conditions Drainage Area Map’ in Appendix A for a map showing proposed catchment boundaries, flow paths and design points. Table VIII is a summary of these areas:

Table VIII – Proposed Conditions Drainage Area Summary

| Discharge Point (DP) | Drainage Area | Sub-Receiving Point | Area (Ac) | CN | Tc (min) | Peak Runoff Rate (cfs) - Undetained | | | |
|----------------------|--------------------|------------------------|--------------|----|----------|-------------------------------------|-------------|-------------|--------------|
| | | | | | | 1-Yr Storm | 10-Yr Storm | 25-Yr Storm | 100-Yr Storm |
| DP #1 | DA #1A-I | - | 26.04 | 89 | 32.8 | 18.87 | 43.22 | 57.06 | 84.08 |
| | DA #1A-II | Pond (P-1) | 10.12 | 92 | 6.0* | 18.84 | 38.25 | 48.91 | 69.47 |
| | DA #1A-III | Bio (B-1) & Pond (P-1) | 5.40 | 95 | 6.0* | 11.84 | 22.14 | 27.74 | 38.53 |
| | DA #1A-IV | Bio (B-2) & Pond (P-1) | 6.75 | 92 | 6.0* | 12.57 | 25.52 | 32.64 | 46.36 |
| | DA #1A-V | Bio (B-3) & Pond (P-1) | 5.32 | 94 | 6.0* | 11.08 | 21.28 | 26.84 | 37.53 |
| | DA #1A-VI | Bio (B-4) & Pond (P-1) | 2.57 | 94 | 6.0* | 5.36 | 10.29 | 12.97 | 18.14 |
| | DA #1 Total | - | 56.21 | - | - | - | - | - | - |
| DP #2 | DA #2A-I | WQU | 40.03 | 96 | 20.2 | 60.68 | 111.62 | 139.28 | 192.64 |
| | DA #2A-II | Bio (B-6) | 2.98 | 96 | 6.0* | 6.84 | 12.48 | 15.55 | 21.46 |
| | DA #2A Total | - | 43.01 | - | - | 64.21 | 118.34 | 147.81 | 204.68 |
| | DA #2A Reach | - | - | - | 6.9 | 63.38 | 116.85 | 145.94 | 202.12 |
| | DA #2B | WQU | 11.87 | 98 | 6.0* | 29.40 | 51.38 | 63.39 | 86.65 |
| | DA #2B Reach | - | - | - | 8.0 | 28.54 | 49.89 | 61.55 | 84.14 |
| | DA #2C | - | 11.52 | 91 | 6.0* | 20.20 | 42.21 | 54.38 | 77.89 |
| | DA #2D | WQU | 17.42 | 98 | 6.0* | 43.13 | 75.39 | 93.00 | 127.13 |
| | DA #2Bypass | Bypasses Chambers | - | - | - | 43.13 | 70.00 | 70.00 | 70.00 |
| | DA #2D Total | - | - | - | - | 43.13 | 73.65 | 81.21 | 113.36 |
| | DA #2 Total | - | 83.81 | - | - | - | - | - | - |

Refer to next page for continuation of table

| Discharge Point (DP) | Drainage Area | Sub-Receiving Point | Area (Ac) | CN | Tc (min) | Peak Runoff Rate (cfs) - Undetained | | | |
|----------------------|----------------------|------------------------|---------------|----|----------|-------------------------------------|-------------|-------------|--------------|
| | | | | | | 1-Yr Storm | 10-Yr Storm | 25-Yr Storm | 100-Yr Storm |
| DP #3 | DA #3A-I | - | 31.33 | 87 | 39.4 | 17.20 | 42.27 | 56.84 | 85.61 |
| | DA #3A-II | Bio (B-5) & Pond (P-2) | 14.94 | 94 | 6.0* | 31.10 | 59.75 | 75.34 | 105.36 |
| | DA #3 Bypass | To Bio (B-5) | - | - | - | 14.30 | 14.30 | 14.30 | 14.30 |
| | DA #3A-III | Pond (P-2) | 2.30 | 83 | 6.0* | 2.33 | 6.22 | 8.56 | 13.24 |
| | DA #3A Reach | - | - | - | 3.6 | 0.40 | 3.58 | 7.88 | 12.57 |
| | DA #3 Total | - | 48.57 | - | - | 17.50 | 45.25 | 62.85 | 98.15 |
| | DA #3 Reach | - | - | - | 1.6 | 17.43 | 45.08 | 62.62 | 97.88 |
| | DA #3B | - | 7.41 | 84 | 20.4 | 4.91 | 13.28 | 18.27 | 28.27 |
| | DA #3B Reach | - | - | - | 8.5 | 4.87 | 13.17 | 18.16 | 28.81 |
| | DA #3 Total | - | 55.98 | - | - | - | - | - | - |
| Total | DA Total (PT) | - | 196.00 | - | - | - | - | - | - |

*Minimum time of concentration value of 6 minutes used, calculated time may have been less.

XVII. Existing and Proposed Condition Stormwater Modeling

A. Hydraulic Modeling and Methodology

The privately-owned, closed-conduit storm sewer system has been designed to gravity convey the 10-year storm event to either a post-construction management practice or existing downstream storm sewer. The new pipes were sized using Autodesk’s Storm and Sanitary Analysis software and the Rational Method. The Intensity-Duration-Frequency (IDF) curve was taken from the Cornell Extreme Precipitation data studies. A manning’s n-value of 0.012 was used to model High-Density Polyethylene Pipe that is slightly aged. A free-outfall tailwater condition is utilized in the design. New storm sewers downstream of stormwater management practices operate under pressure flow conditions and are included in the HydroCAD modeling.

B. Hydraulic Modeling Results

The proposed storm sewer system design is shown on the Construction Drawings. All new proposed gravity-flow pipes have a design flow that does not exceed the pipe capacity. Refer to Appendix D for the storm sewer sizing analysis results reports and the 10-year IDF curve.

C. Hydrologic Modeling and Methodology

The SCS hydrologic analysis method, as outlined in TR-55, was used to derive the stormwater runoff results. Stormwater rainfall amounts were taken from the Cornell Extreme Precipitation data studies. A type II storm distribution curve was used. 100% of the composite drainage areas to Discharge Point #1 and Discharge Point #3 was considered to have HSG=D. For Discharge Point #2, 14% of the composite drainage area was considered to have HSG=C and 86% to have HSG=D. In accordance with TR-55 requirements, a minimum Time of Concentration (Tc) value of 6.0 minutes was used. The analysis was performed using HydroCAD software, version 10.10-4a. Refer to Appendix D for detailed calculations and hydrologic analysis report print-outs.

D. Existing Conditions Hydrologic Analysis Results

The results of the existing condition hydrologic analysis are shown on the following table:

Table IX – Existing Conditions Peak Runoff Rates (& Volumes Ac-ft)

| Drainage Area | 1-Year Rate (cfs) (Vol., Ac-ft) | 10-Year Rate (cfs) (Vol., Ac-ft) | 25-Year Rate (cfs) (Vol., Ac-ft) | 100-Year Rate (cfs) (Vol., Ac-ft) |
|--|--|---|---|--|
| D.A. #1 Total <i>(Modeling Node: DP-1)</i> | 35.65 <i>(4.739)</i> | 80.09 <i>(11.094)</i> | 106.13 <i>(14.856)</i> | 162.21 <i>(22.427)</i> |
| D.A. #2 Total <i>(Modeling Node: DP-2)</i> | 102.83 <i>(8.360)</i> | 194.44 <i>(16.295)</i> | 244.25 <i>(20.729)</i> | 340.23 <i>(29.409)</i> |
| D.A. #3 Total <i>(Modeling Node: DP-3)</i> | 24.90 <i>(2.938)</i> | 65.53 <i>(7.376)</i> | 89.66 <i>(10.061)</i> | 137.79 <i>(15.524)</i> |
| Total Offsite Runoff <i>(Modeling Node: ET)</i> | 154.04 <i>(16.037)</i> | 319.89 <i>(34.765)</i> | 415.86 <i>(45.645)</i> | 607.60 <i>(67.360)</i> |

Refer to Appendix D for detailed calculations and hydrologic analysis report print-outs.

E. Proposed Conditions Hydrologic Analysis Results

The results of the proposed condition hydrologic analysis are shown on the following table:

Table X – Proposed Conditions Peak Runoff Rates (& Volumes Ac-ft)

| Drainage Area | 1-Year Rate (cfs) (Vol., Ac-ft) | 10-Year Rate (cfs) (Vol., Ac-ft) | 25-Year Rate (cfs) (Vol., Ac-ft) | 100-Year Rate (cfs) (Vol., Ac-ft) |
|--|--|---|---|--|
| D.A. #1A Total <i>(Modeling Node: DP-1)</i> | 24.42 <i>(4.321)</i> | 61.72 <i>(9.882)</i> | 94.15 <i>(13.074)</i> | 158.96 <i>(19.402)</i> |
| D.A. #2A Total <i>(Modeling Node: 2AT)</i> | 64.21 <i>(4.993)</i> | 118.34 <i>(9.581)</i> | 147.81 <i>(12.130)</i> | 204.68 <i>(17.111)</i> |
| D.A. #2D Total <i>(Modeling Node: 2DT)</i> | 43.13 <i>(2.345)</i> | 73.65 <i>(4.235)</i> | 81.21 <i>(5.277)</i> | 113.36 <i>(7.304)</i> |
| D.A. #2 Total <i>(Modeling Node: DP-2)</i> | 101.88 <i>(9.921)</i> | 193.21 <i>(18.824)</i> | 236.58 <i>(23.780)</i> | 335.55 <i>(33.468)</i> |
| D.A. #3A Total <i>(Modeling Node: 3AT)</i> | 17.50 <i>(3.427)</i> | 45.25 <i>(7.996)</i> | 62.85 <i>(10.673)</i> | 98.15 <i>(16.009)</i> |
| D.A. #3B Total <i>(Modeling Node: 3B)</i> | 4.91 <i>(0.391)</i> | 13.28 <i>(1.013)</i> | 18.27 <i>(1.393)</i> | 28.27 <i>(2.172)</i> |
| D.A. #3 Total <i>(Modeling Node: DP-3)</i> | 21.61 <i>(3.817)</i> | 56.47 <i>(9.009)</i> | 78.16 <i>(12.066)</i> | 123.65 <i>(18.201)</i> |
| Total Offsite Runoff <i>(Modeling Node: PT)</i> | 125.79 <i>(18.060)</i> | 263.17 <i>(37.715)</i> | 355.68 <i>(48.920)</i> | 541.90 <i>(71.071)</i> |

Refer to Appendix D for detailed calculations and hydrologic analysis report print-outs.

F. Comparison of Total Existing and Proposed Peak Runoff Rates (& Volumes Ac-ft)

Table XI provides a comparison of the total existing and proposed conditions peak runoff rates and volumes for the project runoff.

Table XI – Total Project Runoff

| Condition | 1-Year (cfs) | 10-Year (cfs) | 25-Year (cfs) | 100-Year (cfs) |
|------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| Existing Conditions | 154.04 <i>(16.037)</i> | 319.89 <i>(34.765)</i> | 415.86 <i>(45.645)</i> | 607.60 <i>(67.360)</i> |
| Proposed Condition | 125.79 <i>(18.060)</i> | 263.17 <i>(37.715)</i> | 355.68 <i>(48.920)</i> | 541.90 <i>(71.071)</i> |
| Percent (%) Reduction | 18% <i>(+2.023)</i> | 18% <i>(+2.950)</i> | 14% <i>(+3.275)</i> | 11% <i>(+3.711)</i> |

The results show that the proposed stormwater management practices will reduce the proposed condition peak runoff rates from the project areas to below existing conditions.

The following table provides a comparison of the existing and proposed conditions peak runoff rates and volumes for the total offsite runoff from the project area which includes the consideration of offsite areas located outside of the project boundary that sheet drain to the project.

G. Comparison of Existing and Proposed Peak Runoff Rates (& Volumes Ac-ft) by Discharge Point

The following tables provide a comparison of the existing and proposed conditions peak runoff rates and volumes for the total offsite runoff from the project area by discharge point.

Discharge Point #1 Total – Rush Creek Tributary

| Condition | 1-Year (cfs) | 10-Year (cfs) | 25-Year (cfs) | 100-Year (cfs) |
|------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|-------------------------------------|
| Existing Conditions | 35.65 <i>(4.739)</i> | 80.09 <i>(11.094)</i> | 106.13 <i>(14.856)</i> | 162.21 <i>(22.427)</i> |
| Proposed Condition | 24.42 <i>(4.321)</i> | 61.72 <i>(9.882)</i> | 94.15 <i>(13.074)</i> | 158.96 <i>(19.402)</i> |
| Percent (%) Reduction | 32% <i>(-0.418)</i> | 23% <i>(-1.212)</i> | 11% <i>(-1.782)</i> | 2% <i>(-3.025)</i> |

The peak runoff rate and overall runoff volume to Discharge Point #1A, Rush Creek tributary is reduced as compared with existing conditions for each of the storm events.

Discharge Point #2 Total – Smokes Creek

| Condition | 1-Year (cfs) | 10-Year (cfs) | 25-Year (cfs) | 100-Year (cfs) |
|------------------------------|-------------------------|--------------------------|--------------------------|---------------------------|
| Existing Conditions | 102.83 (8.360) | 194.44 (16.295) | 244.25 (20.729) | 340.23 (29.409) |
| Proposed Condition | 101.88 (9.921) | 193.21 (18.824) | 236.58 (23.780) | 335.55 (33.468) |
| Percent (%) Reduction | 1% (1.561) | 1% (2.529) | 3% (3.051) | 1% (4.059) |

The peak runoff rate to Discharge Point #2: Smokes Creek is reduced to just below existing conditions for each of the analyzed storm events. There is a runoff volume increase from existing conditions as is expected in sites with low-infiltration capacity soils. The Creek is a waterbody with an established floodplain and conveyance capacity. The attenuated peak runoff rate will allow this waterbody to convey the additional volume in a manner mimicking existing conditions. The summary of the impact to the receiving water is limited to the project boundaries and scope of the study performed.

Discharge Point #3A Total – DOT Pond

| Condition | 1-Year (cfs) | 10-Year (cfs) | 25-Year (cfs) | 100-Year (cfs) |
|------------------------------|-------------------------|--------------------------|--------------------------|---------------------------|
| Existing Conditions | 14.57 (1.750) | 37.13 (4.296) | 50.40 (5.824) | 76.73 (8.919) |
| Proposed Condition | 17.50 (3.427) | 45.25 (7.996) | 62.85 (10.673) | 98.15 (16.009) |
| Percent (%) Reduction | -20% (1.677) | -22% (3.700) | -25% (4.849) | -28% (7.090) |

The peak runoff rate to the pond from direct discharge via the existing private storm sewer conveying ECC campus drainage will increase because runoff is diverted away from the storm sewer system in the right-of-way. Refer to table “Discharge Point #3 Total” to see that there is a net reduction in the peak runoff rate to the existing offsite pond.

Discharge Point #3B Total – Southwestern Blvd/DOT Pond

| Condition | 1-Year (cfs) | 10-Year (cfs) | 25-Year (cfs) | 100-Year (cfs) |
|------------------------------|-------------------------|--------------------------|--------------------------|---------------------------|
| Existing Conditions | 10.44 (1.188) | 28.71 (3.080) | 39.68 (4.237) | 61.73 (6.605) |
| Proposed Condition | 4.91 (0.391) | 13.28 (1.013) | 18.27 (1.393) | 28.27 (2.172) |
| Percent (%) Reduction | 53% (-0.797) | 54% (-2.067) | 54% (-2.844) | 54% (-4.433) |

The peak runoff rate to the pond via the existing public storm sewer system in the right-of-way will be reduced for each of the storm events. Refer to table “Discharge Point #3 Total” to see that there is a net reduction in the peak runoff rate to the existing offsite pond.

Discharge Point #3 Total – Southwestern Blvd/DOT Pond

| Condition | 1-Year (cfs) | 10-Year (cfs) | 25-Year (cfs) | 100-Year (cfs) |
|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Existing Conditions | 24.90 (2.938) | 65.53 (7.376) | 89.66 (10.061) | 137.79 (15.524) |
| Proposed Condition | 21.61 (3.817) | 56.47 (9.009) | 78.16 (12.066) | 123.65 (18.201) |
| Percent (%) Reduction | 13% (0.879) | 14% (1.633) | 13% (2.005) | 10% (2.677) |

For Discharge Point #3 receiving point; the existing offsite pond, there will be a decrease in the discharge rate to the pond for each of the storm events. The pond outlet structure and design is assumed to be based on the conveyance of peak runoff rates. Therefore, a reduction in the inflow peak rate should not negatively impact the pond’s performance. There is a runoff volume increase for each of the storm events. When combined with peak rate attenuation, the volume should pass through the downstream entities at an acceptable manner mimicking existing conditions till a large downstream waterbody is reached. Sites with minimal infiltration capacity commonly result in a runoff volume increase however this volume is received by a waterbody that can convey this additional volume to Lake Erie at a lower rate thus mimicking existing conditions. The summary of the impact to the receiving water is limited to the project boundaries and scope of the study performed.

XVIII. Post-Construction Stormwater Management Performance and Sizing

A. Proposed Post-Construction Stormwater Management Practices

The stormwater management facilities proposed to mitigate each of the projects are:

- **Bioretention Facilities**

A total of six (6) separate bioretention facilities are proposed to serve the project and receive stormwater runoff from portions of the new parking areas. Along with the standard surface and subsurface layers, the bioretention facilities will also consist of stilling basins for pretreatment, a spillway to bypass overflows, and an underdrain located in the upper portion of the subsurface gravel layer of the footprint to promote infiltration. Discharges and overflows from the bioretention system will be directed to the downstream stormwater pond.

The bioretention facilities are considered standard practices and designed in accordance with the NYSSMDM Bioretention Facility Practice with underdrain (F-5). This practice provides runoff reduction volume and water quality volume.

- **Wet Ponds**

Two (2) wet ponds are proposed to receive runoff from parking areas west of Abbott Road and discharge from upstream bioretention areas. The wet ponds consist of two cells for permanent retention; a forebay and deep pool, approximately 4-6 ft in depth. Both ponds will have an outlet

structure and downstream piping to attenuate peak discharge rates and convey it to a downstream storm sewer system.

The wet ponds are considered standard practices and designed in accordance with the NYSSMDM Wet Pond Practice (P-2). This practice provides water quality volume, channel reduction volume, and peak rate attenuation.

- **Underground Detention Chambers**

An underground chamber system is designed to provide detention volume to runoff captured in the storm sewer system. An outlet structure from the chamber system will allow runoff rate attenuation to the downstream storm piping.

The underground detention chambers are not considered a treatment practice and only provide peak rate attenuation.

- **Hydrodynamic Water Quality Units**

These unit located underground in a vault or chamber are designed to provide mechanical sediment removal from runoff in a stormwater conveyance system through a system of swirling and baffling. They are proprietary units designed by the manufactures to the tributary drainage area and percent impervious area.

The hydrodynamic Water Quality Units are not considered an alternative treatment practice and only provide water quality volume to redevelopment areas.

- **Impervious Cover Reduction w/ Soil Restoration**

Existing impervious area will be demolished and replaced with pervious lawn areas. Soil restoration practices may be used in these areas to rejuvenate the soils and recapture some of their potential to absorb stormwater runoff.

Impervious cover reduction with soil restoration provides water quality volume to only redevelopment areas where applicable.

Refer to the site maps/construction drawings for the specific location and size of each post-construction stormwater management practice.

B. Runoff Reduction Volume

Runoff Reduction Volume (RRv) is the reduction of the total Water Quality Volume by application of green infrastructure techniques and stormwater management practices to replicate pre-development hydrology. The goal is RRv is always to reduce 100% of the water quality volume through infiltrating practices. This is not always possible in sites with infiltration restrictions. New development projects must, at a minimum, reduce a percentage of the runoff from impervious areas based on the site soils meeting the required minimum runoff reduction volume quantity. The required and provided RRv was separated by Discharge Point. The NYSDEC Green Infrastructure (GI) Worksheet was used to calculate the required and provided RRv applicable to the new development portions of the project. Refer to Appendix D for a copy of this worksheet.

Discharge Point #1 – Rush Creek Tributary

This portion of the project will include ±16.0-acres of new impervious area over existing pervious ground. This impervious area is in a 16.00-acre drainage area which is considered new development and subject to Runoff Reduction Volume (RRv) requirements. The Water Quality Volume required for this area is 55,169 ft³ (1.267 Ac-ft). For 100% of the area having HSG D (S=0.2), the resulting

minimum RRv is 11,034 ft³. Bioretention facilities, tree planting, filter strips all provide RRv. For ease of showing compliance with the requirements, only bioretention facilities are counted as contributing towards providing the required RRv.

The following practices were used to provide RRv:

| Practice | Contributing Area (Ac) | Contributing Imperv. Area (Ac) | RRv Provided (ft ³) | RRv Provided (Ac-ft) |
|----------|------------------------|--------------------------------|---------------------------------|----------------------|
| Bio B-1 | 5.40 | 4.52 | 6,336 | 0.145 |
| Bio B-2 | 6.75 | 4.67 | 6,720 | 0.154 |
| Bio B-3 | 5.32 | 4.09 | 5,760 | 0.132 |
| Bio B-4 | 2.57 | 2.03 | 2,880 | 0.066 |
| Total | 20.05 | 15.31 | 21,696 | 0.498 |

The provided RRv exceeds the minimum required RRv but does not completely reduce the WQv from new development for Discharge Point #1. The remaining 33,473 ft³ (0.768 Ac-ft) of required WQv must be provided through a standard practice.

Discharge Point #2 – South Branch Smokes Creek

This portion of the project will include 1.37-acres of new impervious area over existing pervious ground. This impervious area is in a 5.00-acre drainage area which is considered new development and subject to Runoff Reduction Volume (RRv) requirements. The Water Quality Volume required for this area is 5,373 ft³ (0.123 Ac-ft). For 14% of the area having HSG C (S=0.3) and 86% having HSG D (S=0.2), the resulting minimum RRv is 1,010 ft³. A bioretention facility, tree planting, filter strips all provide RRv. For ease of showing compliance with the requirements, only the bioretention facility are counted as contributing towards providing the required RRv.

The following practice was used to provide RRv:

| Practice | Contributing Area (Ac) | Contributing Imperv. Area (Ac) | RRv Provided (ft ³) | RRv Provided (Ac-ft) |
|----------|------------------------|--------------------------------|---------------------------------|----------------------|
| Bio B-6 | 2.98 | 2.58 | 3,600 | 0.083 |

The provided RRv exceeds the minimum required RRv but does not completely reduce the WQv from new development for Discharge Point #2. The remaining 1,773 ft³ (0.959 Ac-ft) of required WQv must be provided through a standard practice.

Discharge Point #3 – Rush Creek / Existing Offsite Pond / Southwestern Blvd

This portion of the project will include 12.75-acres of new impervious area over existing pervious ground. This impervious area is in a 13.00-acre drainage area which is considered new development and subject to Runoff Reduction Volume (RRv) requirements. The Water Quality Volume required for this new development area is 44,017 ft³ (1.010 Ac-ft). For 100% of the area having HSG D (S=0.2), the resulting minimum RRv is 8,794 ft³. A bioretention facility, tree planting, filter strips all provide RRv. For ease of showing compliance with the requirements, only the bioretention facility are counted as contributing towards providing the required RRv.

The following practice was used to provide RRv:

| Practice | Contributing Area (Ac) | Contributing Imperv. Area (Ac) | RRv Provided (ft ³) | RRv Provided (Ac-ft) |
|----------|------------------------|--------------------------------|---------------------------------|----------------------|
| Bio B-5 | 14.94 | 11.59 | 3,360 | 0.077 |

The provided RRv is below the minimum required RRv for this discharge point however the entire project meets the total RRv requirements because other areas provide excess RRv. The remaining 40,657 ft³ (0.933 Ac-ft) of required WQv must be provided through a standard practice.

Table XII provides a summary of the total required and provided RRv.

Table XII – Total RRv Required & Provided

| Discharge Point | Req'r'd WQv (New Development) (Ac-ft) | Min. Req'r'd RRv (Ac-ft) | Provided RRv (Ac-ft) |
|-----------------|---------------------------------------|--------------------------|----------------------|
| DP #1 | 1.267 | 0.253 | 0.498 |
| DP #2 | 0.123 | 0.023 | 0.083 |
| DP #3 | 1.010 | 0.202 | 0.077 |
| Total | 2.400 | 0.478 | 0.658 |

The total RRv provided for the project exceeds the minimum required RRv but does not completely reduce the WQv for new development areas. The project contains new impervious areas that are not directed towards RRv facilities. These are mainly new parking areas at the north and south ends of the site. It is not feasible to direct all impervious portions of the project to an RRv practice for the following reasons:

- Large portions of the site is existing with an existing storm sewer system that collects runoff from this area. Re-using the existing storm sewer infrastructure limits the extent to which green infrastructure practices may be applied but reduces the overall disturbance impact of the project.
- The site has very shallow depth to bedrock and many green practices require greater depth to bedrock to use. Surface practices generally are only capable of receiving a very small adjacent area and the size of this project generally prohibits that.
- Portions of the site have shallow depth to groundwater which restricts the extent to which green practices may be used.
- The on-site soils are mainly clay and have been previously developed or compacted therefore the soils do not have sufficient infiltration capacity.
- The project does not contain a lot of clean runoff areas such as rooftops which can generally be directed to a shallow treatment practice. The stadium roof will be part of the subsurface collection system which is too deep to utilize green practices.

The following Green Infrastructure Practices were considered;

| Practice | Discussion |
|--|---|
| Preservation of Undisturbed Areas | Undisturbed (non-lawn) areas have been avoided for development to the greatest extent possible. |
| Preservation of Buffers | Buffer areas of sensitive environmental areas were avoided. |
| Reduction of Clearing and Grading | Clearing and Grading is contained to development areas and outside buffers and sensitive environmental areas. |
| Locating Development in Less Sensitive Areas | Development is located outside of sensitive environmental areas. |
| Open Space Design | Not applicable for this type of development |
| Soil Restoration | This practice will be applied to applicable areas. |
| Roadway Reduction | Reduction to the greatest extent possible provided. |
| Sidewalk Reduction | Reduction to the greatest extent possible provided. |
| Driveway Reduction | Reduction to the greatest extent possible provided. |
| Cul-de-sac Reduction | Not applicable for this type of development |
| Building Footprint Reduction | Reduction to the greatest extent possible provided. |
| Parking Area Reduction | Reduction to the greatest extent possible provided. |
| Vegetative Swale | These are used for pre-treatment but provide too little treatment to an extent practical for meeting goals. |
| Conservation of Natural Areas | Natural areas within sensitive environmental areas were maintained but are outside the RRv area. |
| Sheetflow to Riparian Buffers or Filter Strips | Due to downstream flooding concerns, runoff to riparian buffer locations was required to be captured and detained. |
| Tree Planting/Tree Pit | Could not be done to an extent practical for meeting goals. |
| Stream Daylighting | Not applicable, site does not contain restricted streams |
| Disconnected Rooftop Runoff | Stadium rooftop runoff is tied into stadium subsurface drainage system that is too deep to use these practices. Rooftop size exceeds the allowance for these practices and/or practices are not feasible for application to a stadium building. . |
| Rain Gardens | |
| Green Roofs | |
| Stormwater Planters | |
| Rain Barrels and Cisterns | |
| Porous Pavement | Graywater demand does not exceed expected rainfall |
| | Porous pavement is not suitable for this use because vehicles may be heavier trucks and salting operations may be required in the winter for de-icing. |

C. Water Quality Volume

Water Quality Volume (WQv) is a calculation of treatment (sediment and phosphorus removal) provided by stormwater management practices. For new development projects, this must be provided through a combination of “green” practices with RRv capacity and standard practices. For redevelopment areas where existing WQv is provided in a standard practice, the same quantity of WQv must continue to be provided. Redevelopment areas which do not have existing WQv provided by a standard practice are eligible to comply with the Chapter 9 Redevelopment Standards of the NYSDEC Stormwater Management Design Manual. This chapter states that WQv for redevelopment areas is met when existing impervious areas are reduced by 25%, a minimum of 25% of the redevelopment WQv is provided in standard practices, or an equivalent combination of these requirements are met. The required and provided WQv was separated by Discharge Point.

Discharge Point #1 – Rush Creek Tributary

The required Water Quality Volume (WQv) associated with the new development portion of the project to discharge point #1 is 55,169 ft³. Approximately 39% of this volume is provided as RRv. The remaining volume is provided in standard practices. For the wet pond, only permanent retention areas were considered towards the WQv. The following practices were used to provide WQv for the new development portion of the project:

| Practice | WQv (ft ³) |
|--|------------------------|
| RRv (<i>various</i>) | 21,696 |
| Bioretention (B-1:4) (<i>Non-RRv</i>) | 31,944 |
| Wet Pond (P-1) | 4,500 |
| Total | 58,140 |

This volume meets and exceeds the required WQv for new development by 2,970 ft³. The remaining portions of the project are considered redevelopment which does not have existing WQv applied in a standard practice and this extra WQv may be applied to meeting those requirements.

The redevelopment portion of the project to discharge point #1 includes 5.13-acres of impervious asphalt and gravel surfaces which will be removed and replaced with pervious area and 11.11-acres of existing impervious areas to remain. The initial WQv required for redevelopment is 63,742 ft³. This volume will be provided through a combination of impervious cover reduction and standard practices.

The percentage of impervious cover reduction for the redevelopment portion of the project is 31.6%. Since the percentage of reduction is greater than 25% the water quality volume requirements associated with redevelopment for discharge point #1 of the project are considered to be met.

The following is a summary of the required WQv:

| Classification | Required WQv (ft ³) |
|---|---------------------------------|
| New Development | 55,169 |
| Redevelopment – <i>Initial WQv</i> | 63,742 (25%=15,936) |
| Redevelopment – <i>Impervious Cover Reduction</i> | 15,936 |
| Redevelopment – <i>Standard Practice</i> | |
| Total Required WQv | 71,105 (1.632 Ac-ft) |

The following is a summary of the practices used to provide WQv:

| Practice | WQv as RRv (ft ³) | WQv as Non-RRv (ft ³) | Total Prvd'd WQv (ft ³) | Reqr'd WQv (ft ³) |
|-------------------------------------|-------------------------------|-----------------------------------|-------------------------------------|-------------------------------|
| Bio B-1 | 6,336 | 9,408 | 15,744 | - |
| Bio B-2 | 6,720 | 9,755 | 16,475 | - |
| Bio B-3 | 5,760 | 8,561 | 14,321 | - |
| Bio B-4 | 2,880 | 4,219 | 7,099 | - |
| Wet Pond (P-1) | - | 4,500 | 4,500 | - |
| Total WQv in Stnd'd Practice | 22,176 | 53,437 | 58,140 | 55,169 |
| Exist. Imperv. Reduction | - | - | 15,936 | - |
| Total Prvd'd WQv | - | - | 74,075 (1.701 Ac-ft) | 71,105 (1.632 Ac-ft) |

Discharge Point #2 – South Branch Smokes Creek

The required Water Quality Volume (WQv) associated with the new development portion of the project to discharge point #2 is 5,373 ft³. Approximately 67% of this volume is provided as RRv. The remaining volume is provided in standard practices.

The following practices were used to provide WQv for the new development portion of the project:

| Practice | WQv (ft ³) |
|-----------------------------|------------------------|
| RRv (B-6) | 3,600 |
| Bioretention, Non-RRv (B-6) | 5,370 |
| Total | 8,970 |

This volume meets and exceeds the required WQv for new development by 3,597 ft³. The remaining portions of the project are considered redevelopment without existing WQv provided and this extra WQv may be applied to meeting those requirements.

The redevelopment portion of the project to discharge point #2 includes 3.57-acres of impervious asphalt and gravel surfaces which will be removed and replaced with pervious area and 76.18-acres of existing impervious areas to remain. The initial WQv required for redevelopment is 255,288 ft³. This volume will be provided through a combination of impervious cover reduction, standard practices and alternative practice.

The percentage of impervious cover reduction for the redevelopment portion of the project is 4.5%. The remaining 3,596 ft³ of WQv provided in standard practices which may be attributed towards redevelopment is 1.4% of the initial WQv for redevelopment. The total percentage of the initial redevelopment WQv provided from standard practices and impervious cover reduction is 5.9%. Since this is less than 25%, alternative practice are required to be used to meet the remaining requirement. The remaining 19.1% from the initial 25% goal is multiplied by 3 for calculating the required WQv from alternative practices. This results in 57.4% of the initial WQv for redevelopment is required from standard practices which equals 146,422 ft³. This will be provided through several hydrodynamic water quality units.

The following is a summary of the required WQv:

| Classification | Required WQv (ft ³) | |
|---|---|------------------------------|
| New Development | 5,373 | |
| Redevelopment – <i>Initial WQv</i> | 255,288 (5.9%=15,015) 25% - 5.9% = 19.1% x 3 = 57.4% (57.4%=146,422) | |
| Redevelopment – <i>Impervious Cover Reduction</i> | 11,419 (4.5% of Initial WQv) | 15,015 (5.9% of Initial WQv) |
| Redevelopment – <i>Standard Practice</i> | 3,596 (1.4% of Initial WQv) | |
| Redevelopment – <i>Alternative Practice</i> | 146,422 (57.4% of Initial WQv) | |
| Total Required WQv | 166,810 (3.829 Ac-ft) | |

The following is a summary of the practices used to provide WQv:

| Practice | WQv as RRv (ft ³) | WQv as Non-RRv (ft ³) | Total Prvd'd WQv (ft ³) | Req'r'd WQv (ft ³) |
|------------------------------|-------------------------------|-----------------------------------|-------------------------------------|----------------------------------|
| Bio B-6 | 3,600 | 5,370 | 8,970 | 5,373 |
| Exist. Imperv. Reduction | - | 11,419 | 11,419 | - |
| Total WQv in Stnd'd Practice | 3,600 | 16,789 | 20,389 | 20,388 (5,373 + 15,015) |
| WQU #1 (DA #2B) | - | 40,941 | 40,941 | - |
| WQU #2 (DA #2D) | - | 59,680 | 59,680 | |
| WQU #3 (Portions of DA #2A) | - | 46,646 | 46,646 | |
| Total WQv in Alt. Practice | | 147,267 | 147,267 | 146,422 |
| Total WQv | - | - | 167,655 (3.849 Ac-ft) | 166,810 (3.829 Ac-ft) |

Discharge Point #3 – Rush Creek / Existing Offsite Pond

The required Water Quality Volume (WQv) associated with the new development portion of the project to discharge point #3 is 44,017 ft³. Approximately 8% of this volume is provided as RRv. The remaining volume is provided in standard practices.

Under existing conditions, the drainage in this discharge point is direct to an offsite existing stormwater pond which is considered equivalent to a standard practice wet pond. Though the design document for that pond is not available, in conversations with the NYSDOT it was discussed that the pond was designed to provide WQv to the contributing area. The portion of the existing drainage area to the pond in the project analysis area is 51.30-acres with an impervious area of 16.71-acres (32.6%). Using the formula in Chapter 4 of the manual and a 90% rainfall volume of 1.0-inches, the existing offsite pond is expected to provide 63,906 ft³ (1.467 Ac-ft) of WQv to treat this area. The new drainage area to the pond associated with redevelopment is 42.98-acres with an impervious area of 12.94-acres (30%). The required WQv associated with the redevelopment area is 50,063 ft³. The excess WQv in the existing pond resulting from existing impervious cover reduction may be applied to meeting the new development WQv requirements.

The following practices were used to provide WQv for the project:

| Practice | WQv (ft ³) |
|-----------------------------|------------------------|
| RRv (B-5) | 3,360 |
| Bioretention, Non-RRv (B-5) | 5,018 |
| Wet Pond (P-2) | 21,796 |
| Existing Offsite Pond | 63,906 |
| Total | 94,080 |

The following is a summary of the required WQv:

| Classification | Required WQv (ft ³) |
|------------------------------------|---|
| New Development | 44,017 |
| Redevelopment – <i>Initial WQv</i> | 50,063 (<i>100% in standard practice</i>) |
| Total Required WQv | 94,080 (2.160 Ac-ft) |

The following is a summary of the practices used to provide WQv:

| Practice | WQv as RRv (ft ³) | WQv as Non-RRv (ft ³) | Total Prvd'd WQv (ft ³) | Req'r'd WQv (ft ³) |
|------------------|-------------------------------|-----------------------------------|-------------------------------------|--------------------------------|
| Bio B-5 | 3,360 | 5,018 | 8,378 | - |
| Wet Pond P-2 | - | 21,796 | 21,796 | |
| Existing Pond | - | 63,906 | 63,906 | |
| Total WQv | - | - | 94,080 (2.160 Ac-ft) | 94,080 (2.160 Ac-ft) |

Table XIII provides a summary of the total required and provided RRv.

Table XIII – Total WQv Required & Provided

| Discharge Point | Req'r'd WQv (Ac-ft) | Provided WQv (Ac-ft) |
|-----------------|---------------------|----------------------|
| DP #1 | 1.632 | 1.701 |
| DP #2 | 3.829 | 3.849 |
| DP #3 | 2.160 | 2.160 |
| Total | 7.621 | 7.710 |

The total WQv provided for the project exceeds the required WQv and is provided in an appropriate standard or alternative practice dependent on the origination source from a new development area, redevelopment area with existing standard practice treatment, or redevelopment area subject to the reduced redevelopment treatment requirements. Refer to Appendix D for detailed calculations of the required and provided WQv.

D. Channel Protection Volume

Stream Channel Protection Volume (CPv) is a requirement to provide 24-hour extended detention of the one-year, 24-hour storm event remaining from runoff reduction volume in order to protect stream channels from erosion. For redevelopment, this requirement is considered to be met if the 1-yr post-developed storm is detained to pre-development peak runoff rates and velocities.

The following table provides a summary of the calculated total required CPv;

| Classification | Discharge Pt #1 Req'r'd CPv (Ac-ft) | Discharge Pt #2 Req'r'd CPv (Ac-ft) | Discharge Pt #3 Req'r'd CPv (Ac-ft) |
|-----------------------|--|--|--|
| New Development Areas | 0.987 | 0.308 | 0.802 |
| Redevelopment Areas | 0* | 0* | 0* |
| Total Required CPv: | 0.987 | 0.308 | 0.802 |
| Total Required CPv: | 2.097 | | |

*Redevelopment Area are considered 0 because requirements are met through peak rate attenuation.

CPv is provided by providing RRv and attenuating the 1-year design storm outfall approximately 24-hours from existing conditions for new development runoff.

The following table provides a summary of the total provided CPv;

| Practice | Discharge Point #1 Provid'd CPv (Ac-ft) | Discharge Point #2 Provid'd CPv (Ac-ft) | Discharge Point #3 Provid'd CPv (Ac-ft) |
|--|---|---|---|
| Wet Pond | 1.000 | - | 1.085 |
| RRv | 0.498 | 0.083 | 0.077 |
| Total Provided CPv: | 1.498 | 0.083 | 1.162 |
| Total Provided CPv (DP#1, #2 & #3): | 2.743 | | |

The total CPv provided exceeds the required CPv. Refer to Appendix D for detailed calculations of the required and provided CPv.

E. Overbank Flood Control

Overbank Flood Control (Qp) is a requirement to attenuate the post-development 10-year, 24-hour peak discharge rate to pre-development rates to prevent an increase in the frequency and magnitude of out-of-bank flooding. This requirement is met through the proposed stormwater management facilities. Refer to IV. Existing and Proposed Hydrologic Analysis.

F. Extreme Flood Control

Extreme Flood Control (Qf) is a requirement to attenuate the post-development 100-year, 24-hour peak discharge rate to pre-development rates to prevent the increases risk of flood damage from large storm events, maintain the boundaries of the predevelopment 100-year floodplain, and protect the physical integrity of stormwater management practices. This requirement is met through the proposed stormwater management facilities. Refer to IV. Existing and Proposed Hydrologic Analysis.

G. Post-Construction Stormwater Management Practices Description

Six (6) post-construction stormwater management practices are proposed to provide both runoff reduction volume (RRv) and water quality volume (WQv). These are Bioretention Facilities #1 through #6. These practices consist of pretreatment areas and then an area designed to promote groundwater filtering. This portion of the practice contains a subsurface planting soil layer followed by a gravel layer. Underdrain is used in the gravel layer to collect runoff which cannot be accepted as infiltration by the native soils. The surface area of the practice is designed to detain a maximum 6-inch deep pool before bypassing or providing an overflow for additional runoff.

Refer to the following tables for details on the bioretention facility design:

| Practice: | Bioretention Facility #1 (B-1) | Bioretention Facility #2 (B-2) |
|---|--|--|
| Pretreatment | Forebay (3,938 ft ³ min. – 25% of WQv) | Forebay (4,110 ft ³ min. – 25% of WQv) |
| Pretreatment – Top / Bottom Elev. (ft) | TBD | TBD |

| | | |
|--|---|---|
| Top of Practice Elevation (ft) | 751.25 | 751.50 |
| Infiltration Surface – Elev. (ft) & Surface Area | 749.25 13,200 s.f. | 749.50 15,000 s.f. |
| Planting Layer – Depth Top/Bottom Elev. (ft) | 2.5-ft 749.00 / 746.50 | 2.5-ft 749.25 / 746.75 |
| Gravel Layer – Depth Top/Bottom Elev. (ft) | 0.67-ft 746.50 – 745.83 | 0.67-ft 746.75 – 746.08 |
| Side Slopes (h:v) <i>(Practice & Pretreatment)</i> | 2:1 | 2:1 |
| Avg. Ht. of Ponding Spillway Elev. (ft) <i>(Primary Grate)</i> | 0.5-ft 749.75 | 0.5-ft 750.00 |
| Underdrain | 6-inch diameter @ 0.2% slope | 6-inch diameter @ 0.2% slope |
| Secondary Outlet Components | Culvert (Primary): 87' – 12" HDPE @ 0.29%, Inv:747.00 Grate (Secondary): TG:750.75 Culvert (Secondary): 45' – 12" HDPE @ 3.6%, Inv:744.13 | Culvert (Primary): 105' – 12" HDPE @ 0.24%, Inv:747.25 Grate (Secondary): TG:750.75 Culvert (Secondary): 130' – 12" HDPE @ 6.1%, Inv:738.00 |
| Rock Spillway Elev. (ft) & Spillway Width (ft) | 751.00 10.0' | 751.00 10.0' |
| Assumed Groundwater Elev. (ft) | TBD | TBD |
| 1-Yr Ponding Elev. | 749.79 | 750.07 |
| 10-Yr Ponding Elev. | 750.16 | 750.54 |
| 25-Yr Ponding Elev. | 750.56 | 750.87 |
| 100-Yr Ponding Elev. | 751.16 | 751.27 |

TBD = To Be Determined as design progresses

| Practice: | Bioretention Facility #3 (B-3) | Bioretention Facility #4 (B-4) |
|---|--|--|
| Pretreatment | Forebay (3,581 ft ³ min. – 25% of WQv) | Forebay (1,775 ft ³ min. – 25% of WQv) |
| Pretreatment – Top / Bottom Elev. (ft) | TBD | TBD |
| Top of Practice Elevation (ft) | 752.00 | 755.00 |
| Infiltration Surface – Elev. (ft) & Surface Area | 750.00 12,000 s.f. | 753.00 6,000 s.f. |
| Planting Layer – Depth Top/Bottom Elev. (ft) | 2.5-ft 751.75 / 749.25 | 2.5-ft 752.75 / 750.25 |

| | | |
|--|---|---|
| Gravel Layer – Depth Top/Bottom Elev. (ft) | 0.67-ft 749.25 – 748.58 | 0.67-ft 750.25 – 749.58 |
| Side Slopes (h:v) <i>(Practice & Pretreatment)</i> | 2:1 | 2:1 |
| Avg. Ht. of Ponding Spillway Elev. (ft) <i>(Primary Grate)</i> | 0.5-ft 750.50 | 0.5-ft 753.50 |
| Underdrain | 6-inch diameter @ 0.2% slope | 6-inch diameter @ 0.2% slope |
| Secondary Outlet Components | Culvert (Primary): 30' – 8" HDPE @ 1.67%, Inv:746.50 | Culvert (Primary): 230' – 12" HDPE @ 1.30%, Inv:746.50 |
| Rock Spillway Elev. (ft) & Spillway Width (ft) | 751.50 10.0' | 754.50 10.0' |
| Assumed Groundwater Elev. (ft) | TBD | TBD |
| 1-Yr Ponding Elev. | 749.79 | 753.75 |
| 10-Yr Ponding Elev. | 750.16 | 754.09 |
| 25-Yr Ponding Elev. | 750.56 | 754.33 |
| 100-Yr Ponding Elev. | 751.16 | 754.74 |

TBD = To Be Determined as design progresses

| Practice: | Bioretention Facility #5 (B-5) | Bioretention Facility #6 (B-6) |
|--|---|---|
| Pretreatment | Forebay (9,859 ft ³ min. – 25% of WQv) | Forebay (2,243 ft ³ min. – 25% of WQv) |
| Pretreatment – Top / Bottom Elev. (ft) | TBD | TBD |
| Top of Practice Elevation (ft) | 743.00 | 763.00 |
| Infiltration Surface – Elev. (ft) & Surface Area | 740.50 7,000 s.f. | 761.00 7,500 s.f. |
| Planting Layer – Depth Top/Bottom Elev. (ft) | 2.5-ft 740.50 / 738.00 | 2.5-ft 761.00 / 758.50 |
| Gravel Layer – Depth Top/Bottom Elev. (ft) | 0.67-ft 738.00 – 737.33 | 0.67-ft 758.50 – 757.83 |
| Side Slopes (h:v) <i>(Practice & Pretreatment)</i> | 2:1 | 2:1 |
| Avg. Ht. of Ponding Spillway Elev. (ft) <i>(Primary Grate)</i> | 0.5-ft 741.00 | 0.5-ft 761.50 |
| Underdrain | 6-inch diameter @ 0.2% slope | 6-inch diameter @ 0.2% slope |
| Secondary Outlet Components | Culvert (Primary): 170' – 18" HDPE @ 0.60%, Inv:737.00 | Culvert (Primary): 100' – 12" HDPE @ 1.00%, Inv:758.00 |

| | | |
|---|-----------------|-----------------|
| Rock Spillway Elev. (ft) & Spillway Width (ft) | 742.50 10.0' | 762.00 10.0' |
| Assumed Groundwater Elev. (ft) | TBD | |
| 1-Yr Ponding Elev. | 741.58 | 761.79 |
| 10-Yr Ponding Elev. | 741.65 | 762.11 |
| 25-Yr Ponding Elev. | 741.69 | 762.25 |
| 100-Yr Ponding Elev. | 741.94 | 762.45 |

TBD = To Be Determined as design progresses

| BIORETENTION - Standard Practice F-5 | |
|---|---|
| Requirements | Compliance |
| 6.4.2 Conveyance | |
| If runoff is delivered by storm pipe, design off-line. | Runoff is received to the practices by both sheet flow and storm pipes. A spillway bypasses excessive runoff. |
| Provide an overflow to pass volume beyond WQv. | An overflow weir spillway is provided for each facility |
| Use a flow regulator to divert WQv to practice and bypass larger flows. | Each facility sized to treat the entire drainage area to it. |
| Equip with a minimum 4: perforated pipe underdrain in a gravel layer with a permeable filter fabric between gravel and filter media. | A minimum 4" diameter perforated underdrain is provided. |
| Provide min. 2' separation from filter bottom to groundwater. | The design is intended to provide this based on available subsurface information. |
| 6.4.3. Pretreatment | |
| Provide pretreatment equivalent to 25% of the WQv. | This is provided in the forebays. |
| Required sedimentation basin area to meet equation | The facilities are sized using the NYSDEC GI Worksheet, see Appendix D. |
| 6.4.4. Treatment | |
| Size system to temporarily hold 75% of the WQv prior to filtration. | System is sized in accordance with NYSDEC GI Worksheet. |
| Filter media to consist of medium sand. | System complies, refer to detail on Site Development Plans. |
| Bioretention systems shall consist of the following treatment components: planting bed, mulch layer, and 6" deep ponding area. Soils shall meet manual. | It is our understanding the NYSDEC no-longer requires the mulch layer as this sometimes has adverse environmental impacts. The system does provide a planting bed in accordance with Fig. 6.19 and a 6" deep ponding area and soils meeting Appendix H. |
| 6.5.5. Landscaping | |
| Provide a dense and vigorous vegetative cover over contributing pervious areas prior to brining practice on-line. | This is specified on the plans and in this report. |

| | |
|--|---|
| Provide a landscaping plan for bioretention areas. | This is provided in the Construction Drawings. |
| 6.5.6. Maintenance | |
| A legally binding and enforceable maintenance agreement shall be executed between the facility and the owner. | This will be completed prior to the filing of the Notice of Termination. |
| Sediment shall be removed from stilling basin when it reaches 6" of accumulation. Restrict vegetation height to 18". Clean/repair outlet devices. Remove trash and debris. Remove silt from filter bed when accumulation exceeds 1". When filtering capacity diminishes, remove top few inches of discolored material and replace. | This will be specified in the maintenance agreement and the Long-Term Maintenance Plan. |

Two (2) post-construction stormwater management practices are proposed to provide both water quality volume and peak runoff-rate reduction. This is a Wet Pond "P-1" and Wet Pond "P-2" which each consist of two cells of permanent pools of water referred to as a forebay and a deep pool. The practices contain an aquatic bench for treatment, detention storage volume, and an outlet structure to attenuate discharge rates. These practices have been designed to discharge to existing downstream storm sewers.

| Practice: | Wet Pond (P-1) | Wet Pond (P-2) |
|---|---|---|
| Pretreatment | Forebay (TBD ft ³ – X% of WQv) | Forebay (TBD ft ³ – X% of WQv) |
| Pretreatment – Top / Bottom Elev. (ft) | 746.50 / 740.50 | 736.00 / 730.00 |
| Deep Pool Volume | TBD c.f. | TBD c.f. |
| Deep Pool (Pond Bottom) Top / Bottom Elev. (ft) | 746.50 / 740.50 | 736.00 / 730.00 |
| Approx. Groundwater Elev.(ft) | TBD | TBD |
| Water Surface Elevation (ft) | 746.50 | 736.00 |
| Detention Volume | 122,816 c.f. | 177,873 c.f. |
| Side Slopes (h:v) <i>(Practice & Pretreatment)</i> | Above Water Surface: 4:1 Below Water Surface: 10-15' wide aquatic bench at 10% followed by 2:1 to bottom | Above Water Surface: 4:1 Below Water Surface: 10-15' wide aquatic bench at 10% followed by 2:1 to bottom |

| | | |
|----------------------------|---|--|
| Top of Berm Elevation (ft) | 751.00 | 741.00 |
| Outlet Components | Culvert (Primary): 85-ft of 30" @ 0.19% 24" sq. Grate Elev.=748.75 3"D Orifice Elev.=746.50 | Culvert:220-ft of 24" @ 0.38% 24" sq. Grate Elev. = 738.75 18"(W)x6"(H) Orifice Elev.=737.65 4"D Orifice Elev.=736.00 |
| Emergency Spillway | 20-ft wide @ elev.:749.75, 1:3 side slopes | 20-ft wide @ elev.: 740.00, 1:3 side slopes |
| 1-Yr Ponding Elev. | 748.76 | 737.64 |
| 10-Yr Ponding Elev. | 749.23 | 738.62 |
| 25-Yr Ponding Elev. | 749.44 | 739.14 |
| 100-Yr Ponding Elev. | 750.07 | 740.07 |

TBD = To Be Determined as design progresses

The following Tables show compliance of the practices with the requirements:

| WET POND – Standard Pract. P-2 | |
|--|--|
| Requirement | Compliance |
| 6.1.1 Feasibility | |
| Not to be located within jurisdictional waters, including wetlands. | Not located with wetland or 100-ft wetland buffer. |
| Determine if pond is a dam. | Maximum embankment is less than 6-ft which falls below the threshold of a dam – <i>verification required with final design</i> |
| Avoid direction of hotspot runoff | Proposed land use is not hot spot. |
| Provide 2' min. separation from groundwater in sole source aquifer areas. | Site is not located within a sole source aquifer. |
| 6.1.2 Conveyance | |
| Provide forebay at each inflow point unless less than 10% of total design flow to pond. | A forebay is provided at the inlet |
| Modify the channel below a pond outfall to prevent erosion. | A riprap spillway is used to meet this requirement. |
| Use a stilling basin or outlet protection to reduce flow velocities from the principal spillway. | The principal spillway connects to a downstream storm sewer system. |
| 6.1.3 Pretreatment | |
| Utilize a forebay sized to contain 10% of the WQv and be 4-6 ft deep. | <i>Provide information to show compliance with final design</i> |
| Design forebay with non-erosive outlet conditions. | A riprap spillway is provided to meet this. |
| Provide direct access for maintenance. | The facility is accessible on all sides for maintenance. |
| Provide 100% of WQv in pretreatment for hot spot runoff in sole source aquifers | N/A |
| 6.1.4 Treatment | |

| | |
|--|---|
| Provide water quality treatment, 100% as a permanent pool. | This requirement is met. |
| Provide a minimum length to width ratio of 1.5:1 | The approximate ratio is 2:1 |
| Provide a minimum surface area : drainage area of 1:100 | <i>Provide information to show compliance with final design</i> |
| 6.1.5 Landscaping | |
| Provide a 15-ft wide aquatic bench, with a max. depth of 18-inches below the water surface along the perimeter of all pools 4-ft or greater in depth. Provide pond side slopes 4:1 or flatter or a safety bench. | An aquatic bench is provided that has an average width of 10-15 ft and a max. depth of 18-inches. The pond has side slopes of 4:1 to the water surface elevation. |
| Provide landscaping plan for pond and buffer. | This is provided on the construction drawings. |
| Establish aquatic bench vegetation before bringing pond into service. | This is specified within this SWPPP and the plans. |
| Provide a buffer that extends 25-ft from the max. water surface elevation. | This is complied with. |
| Woody vegetation may not be planted or allowed to grow within 15-ft of the toe of embankment and 25-ft from the principal spillway structure. | This requirement is noted within the maintenance section of this report. |
| 6.1.6 Maintenance | |
| Provide a legally binding and executable agreement for pond maintenance with a responsible authority as condition of approval. | This will be prepared and complied with before the Notice of Termination is filed. |
| Equip principal spillway with a removable trash rack generally accessible from dry land. | This is shown on the outlet structure detail in the Site Development Plans. |
| Sediment removal in the forebay shall occur every 5-6 years or after 50% of the total forebay capacity is lost. | This is noted in the maintenance section of this report. |
| All required safety elements must be inspected and maintained on an annual basis, unless prior inspections indicate more frequent maintenance is required. | This is noted in the maintenance section of this report. |
| All required maintenance elements must be included in a comprehensive operation and maintenance plan. | This is complied with and included in this report. |
| A maintenance right-of-way or easement shall extend to the pond from a public or private road. | This will be completed prior to the Notice of Termination submission. |
| A low flow orifice shall be provided, with the size for the orifice sufficient to ensure that no clogging shall occur. | A 3-inch diameter low flow orifice is provided, the design is per the DEC Manual to prevent clogging. |
| The riser shall be located within the embankment. | The riser is located within the embankment. |
| Provide access to the riser by lockable manhole covers and steps. The principal spillway opening | The outlet structure has a bolted frame which may be removed for access. The principal spillway is an existing storm sewer pipe. |

| | |
|--|---|
| should be fenced with pipe or rebar at 8-inch intervals for safety purposes. | |
| Except where local slopes prohibit this design, each pond shall have a drain pipe that can completely or partially drain the pond within 24 hours. | The pond is equipped with a pond drain. |
| The WQV, ED outlet and the pond drain shall be equipped with an adjustable gate valve. Locate valve inside riser. | The low flow orifice is equipped with a valve located inside of the outlet structure. |
| Warning signs must be posted prohibiting swimming, wading, and skating, warning of possible contamination or pollution of pond water and indicating maximum depth of pond. | Warning signs will be posted post-construction and will be the responsibility of the owner. |
| The principal spillway opening shall not permit access by small children. | The spillway is an existing pipe. |
| When all safety and slope requirements cannot be met, perimeter fencing is required at or above the maximum water surface level. | All feasible safety requirements have been met. |

One (1) post-construction stormwater management practice is proposed to provide just peak runoff-rate reduction. This is an underground chamber detention system C-1). These are underground storage basins designed to temporarily retain runoff. A bypass structure upstream of the chambers will allow low flows to by-pass the chamber system and higher flows will be directed to it. An outlet structure is used to attenuate runoff from the chambers through an undersized orifice before it is discharged downstream. The total number of chambers and multi-stage outlet structure from the chamber system will be determined as detailed design progresses.

Refer to the following table for details on the chamber design:

| Practice: | Chambers |
|--|---|
| Inflow Bypass Structure | 0 – 70 cfs – bypasses chambers Greater than 70 cfs – to chambers |
| Chamber Manufacturer & Type (Chamber Dimensions) | ADS StormTech DC-780 (45.4"W x 30.0"H x 7.12'L = 46.2 cf) |
| Total Number (#) of Chambers (# in row x # of rows) | ±144 – To Be Confirmed (12 in row x 12 rows) |
| Stone Base Size (L / W) (ft) & Inv. Elev. (ft) | 715.65'L / 476.50'W Inv = 748.00 ft |
| Stone Base Depth & Camber Stone Cover Depth | 9 inches & 6 inches |
| Overall Height of System (Top Elevation, ft) | 2.75 Ft (751.75) |
| Stone Void Space | 40% |

| | |
|----------------------|-------------------------------|
| Outlet Components | Culvert:165-ft of 24" @ 0.39% |
| 1-Yr Ponding Elev. | 748.00 |
| 10-Yr Ponding Elev. | 748.37 |
| 25-Yr Ponding Elev. | 749.44 |
| 100-Yr Ponding Elev. | 751.54 |

One (1) post-construction stormwater management practice is proposed to provide just water quality volume and is considered an alternative practice. This is a proprietary water quality treatment unit approved by the NYSDEC for use on redevelopment projects. The unit is sized to treat the contributing drainage area and is equipped with a bypass for larger flows.

Refer to the following table for details on the chamber design:

| Practice: | D.A. Name | Drainage Area (Ac) | % Imperv. | Avail. WQv (cf) | Water Quality Unit |
|-----------|-----------|--------------------|-----------|-----------------|--------------------|
| WQU #1 | #2B | 11.87 | 100% | 40,941 | To Be Determined |
| WQU #2 | #2D | 17.42 | 99% | 59,680 | To Be Determined |
| WQU #3 | #2D | 14.00 | 96% | 46,646 | To Be Determined |

XIX. Intermediate Phase Drainage Conditions

To Be Completed with Final Design

APPENDIX A

Mapping

Stormwater Pollution Prevention Plan
 New Bills Stadium, Erie County

Figure #1 - U.S.G.S. QUADRANGLE LOCATION MAP

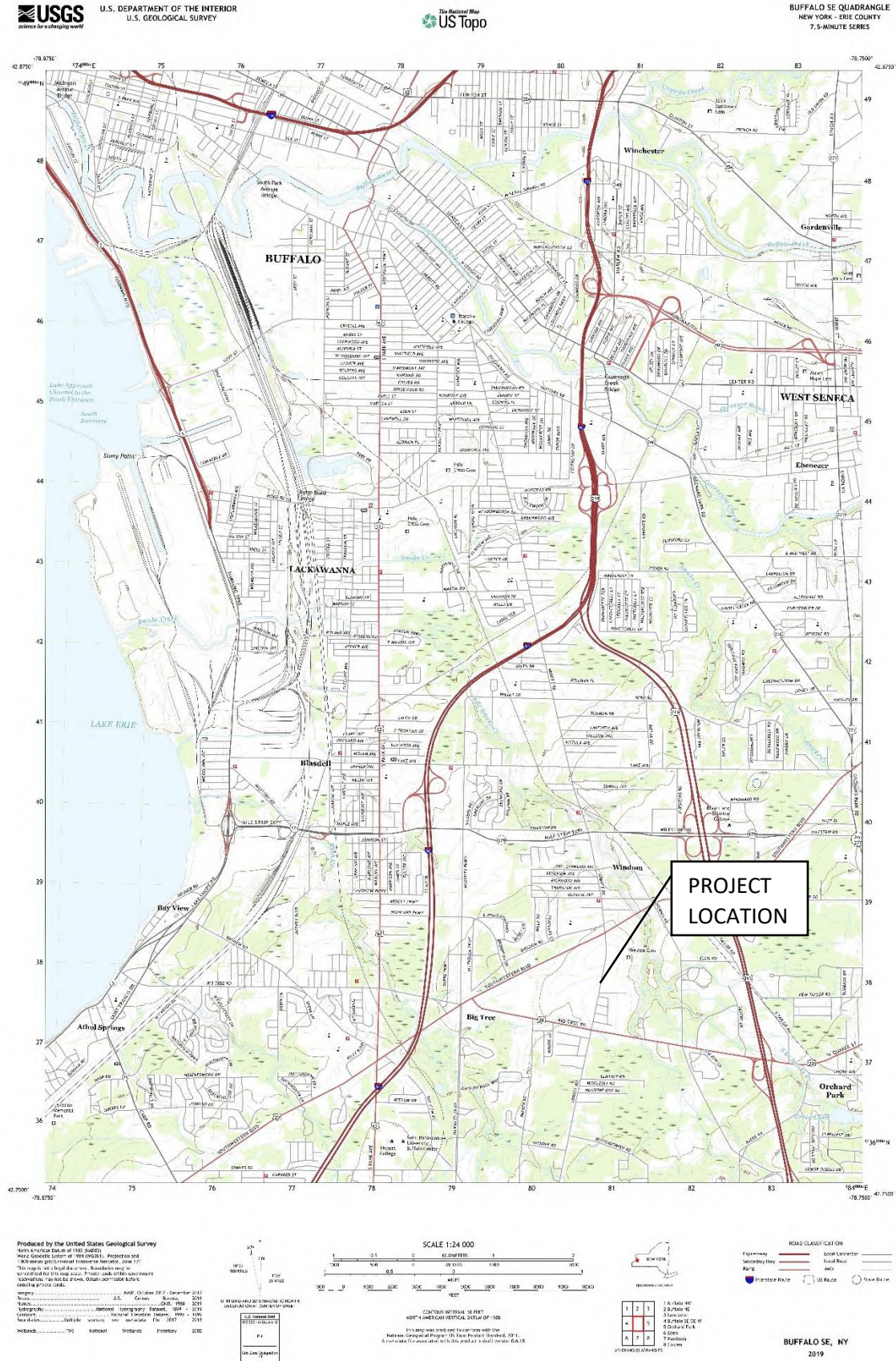
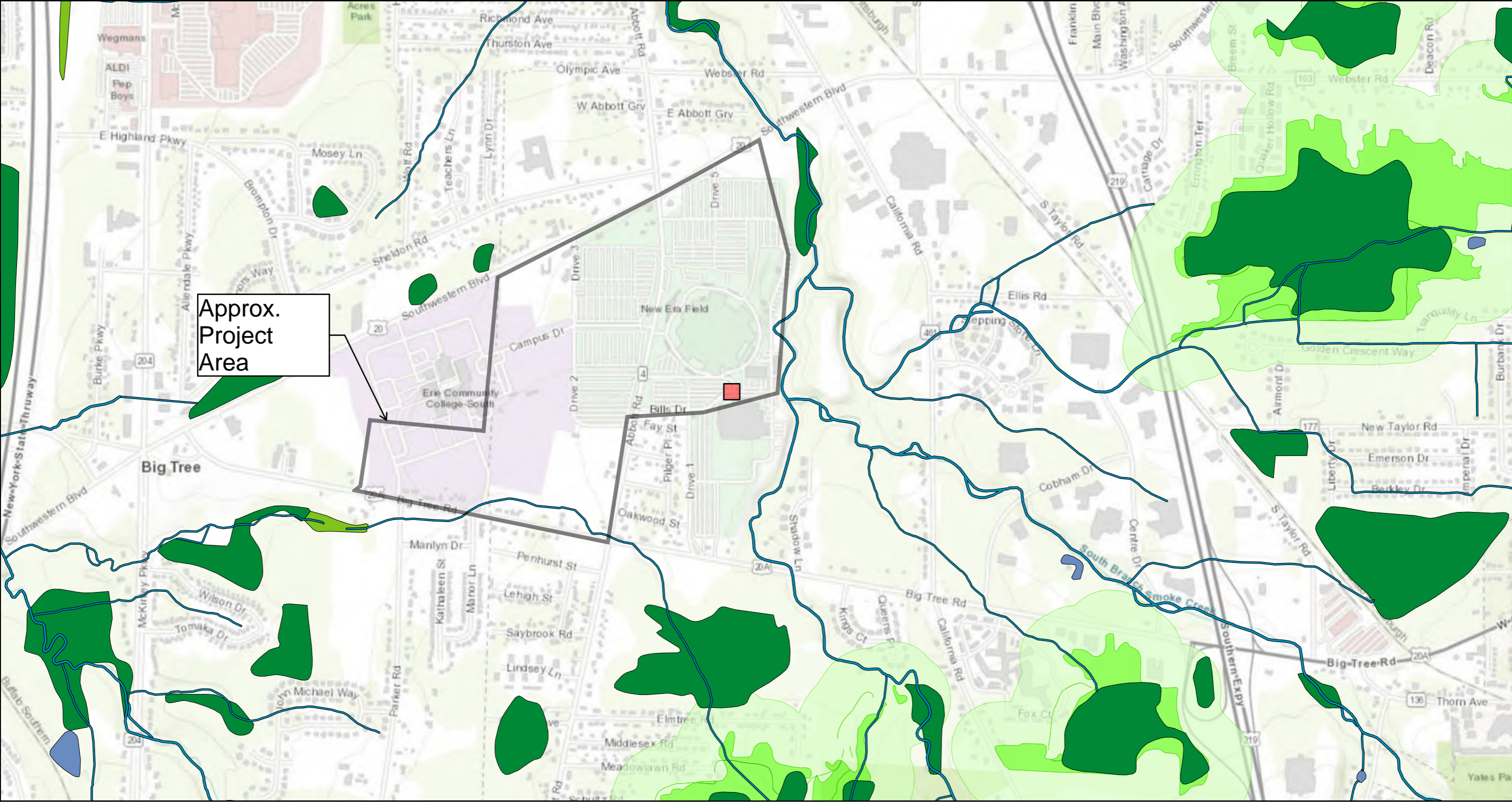
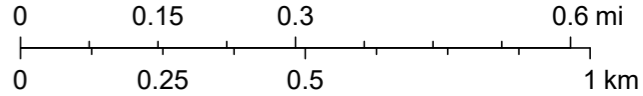


FIGURE #2: Environmental Resource Mapper



April 21, 2022

1:18,056



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Stormwater Pollution Prevention Plan
New Bills Stadium, Erie County

Figure #3 - SHPO MAP

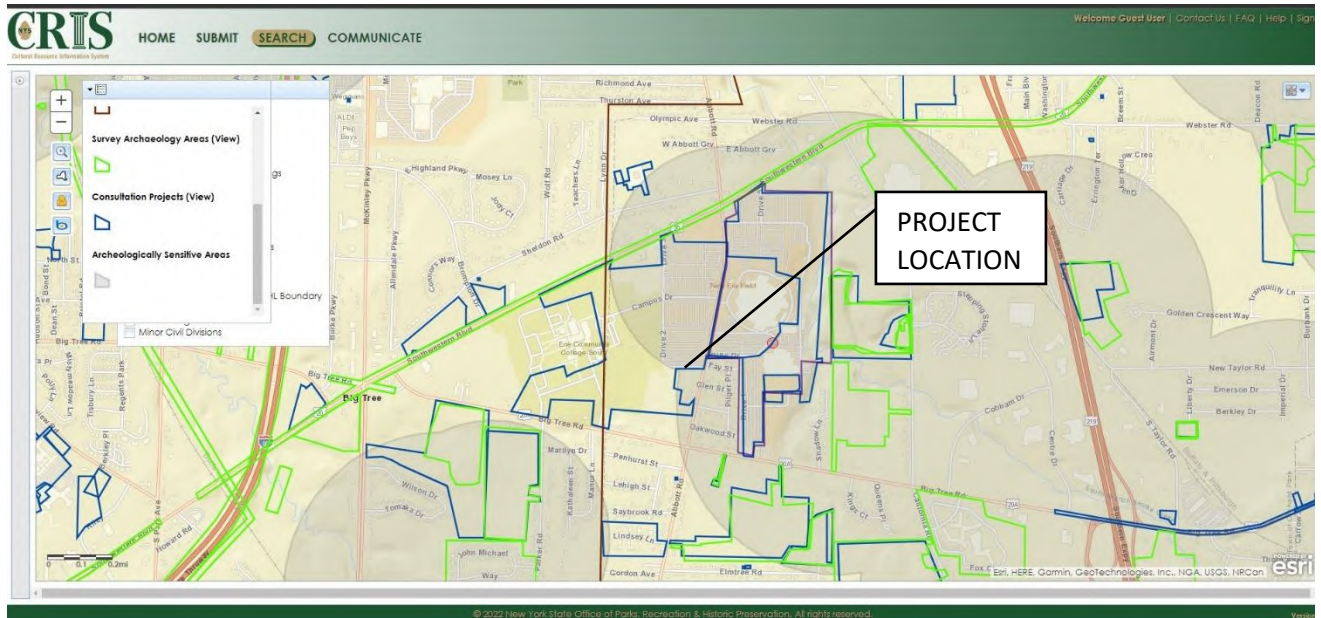
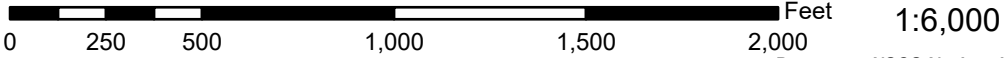
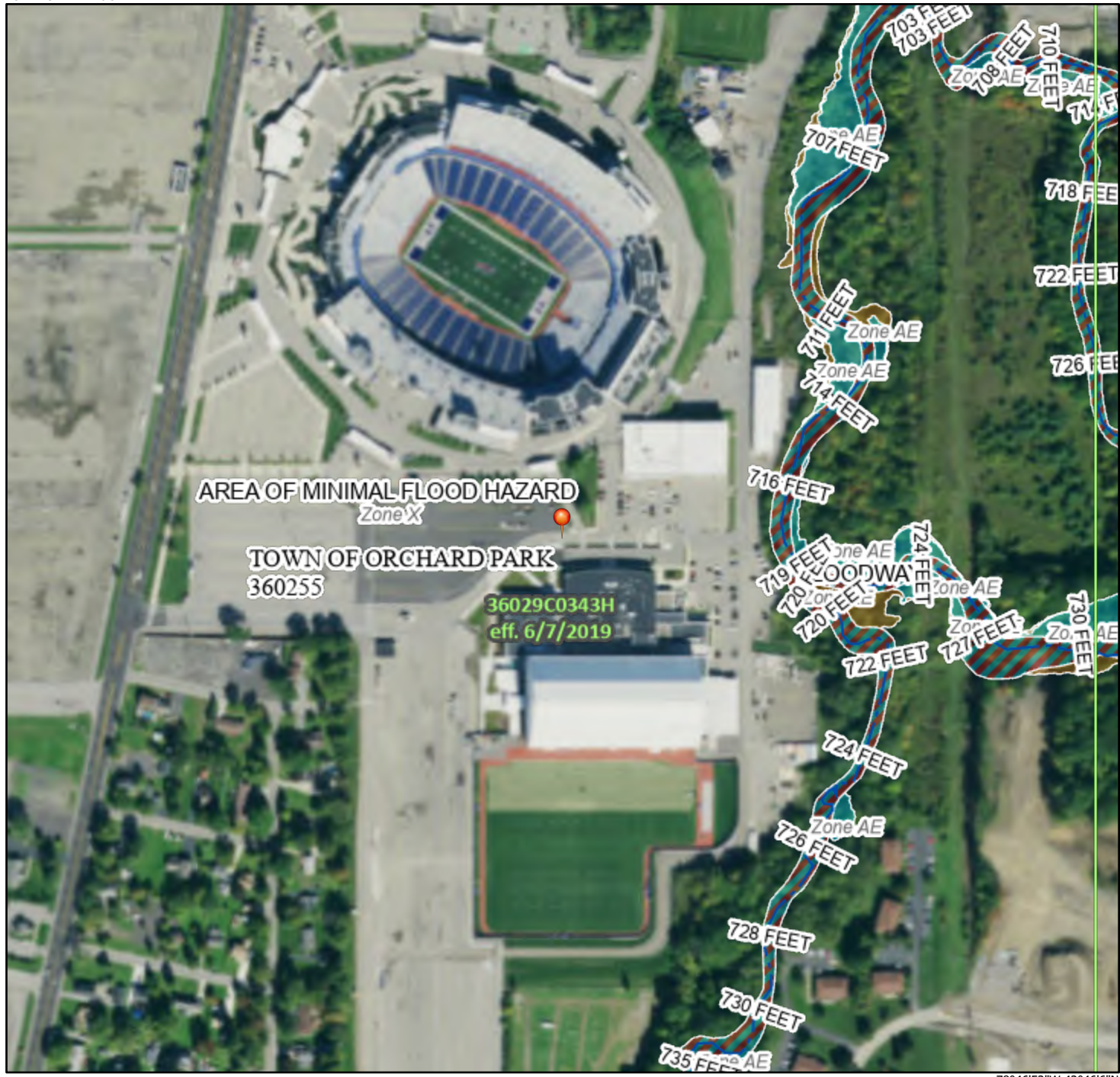


Figure #4 National Flood Hazard Layer FIRMette



78°47'29"W 42°46'32"N



Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

| | | |
|----------------------------|--|--|
| SPECIAL FLOOD HAZARD AREAS | | Without Base Flood Elevation (BFE) Zone A, V, A99 |
| | | With BFE or Depth Zone AE, AO, AH, VE, AR |
| | | Regulatory Floodway |

| | | |
|-----------------------------|--|---|
| OTHER AREAS OF FLOOD HAZARD | | 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X |
| | | Future Conditions 1% Annual Chance Flood Hazard Zone X |
| | | Area with Reduced Flood Risk due to Levee. See Notes. Zone X |
| | | Area with Flood Risk due to Levee Zone D |

| | | |
|-------------|--|---|
| OTHER AREAS | | NO SCREEN Area of Minimal Flood Hazard Zone X |
| | | Effective LOMRs |
| | | Area of Undetermined Flood Hazard Zone D |

| | | |
|--------------------|--|----------------------------------|
| GENERAL STRUCTURES | | Channel, Culvert, or Storm Sewer |
| | | Levee, Dike, or Floodwall |

| | | |
|----------------|--|---|
| OTHER FEATURES | | 20.2 Cross Sections with 1% Annual Chance |
| | | 17.5 Water Surface Elevation |
| | | Coastal Transect |
| | | Base Flood Elevation Line (BFE) |
| | | Limit of Study |
| | | Jurisdiction Boundary |
| | | Coastal Transect Baseline |
| | | Profile Baseline |
| | | Hydrographic Feature |

| | | |
|------------|--|---------------------------|
| MAP PANELS | | Digital Data Available |
| | | No Digital Data Available |
| | | Unmapped |



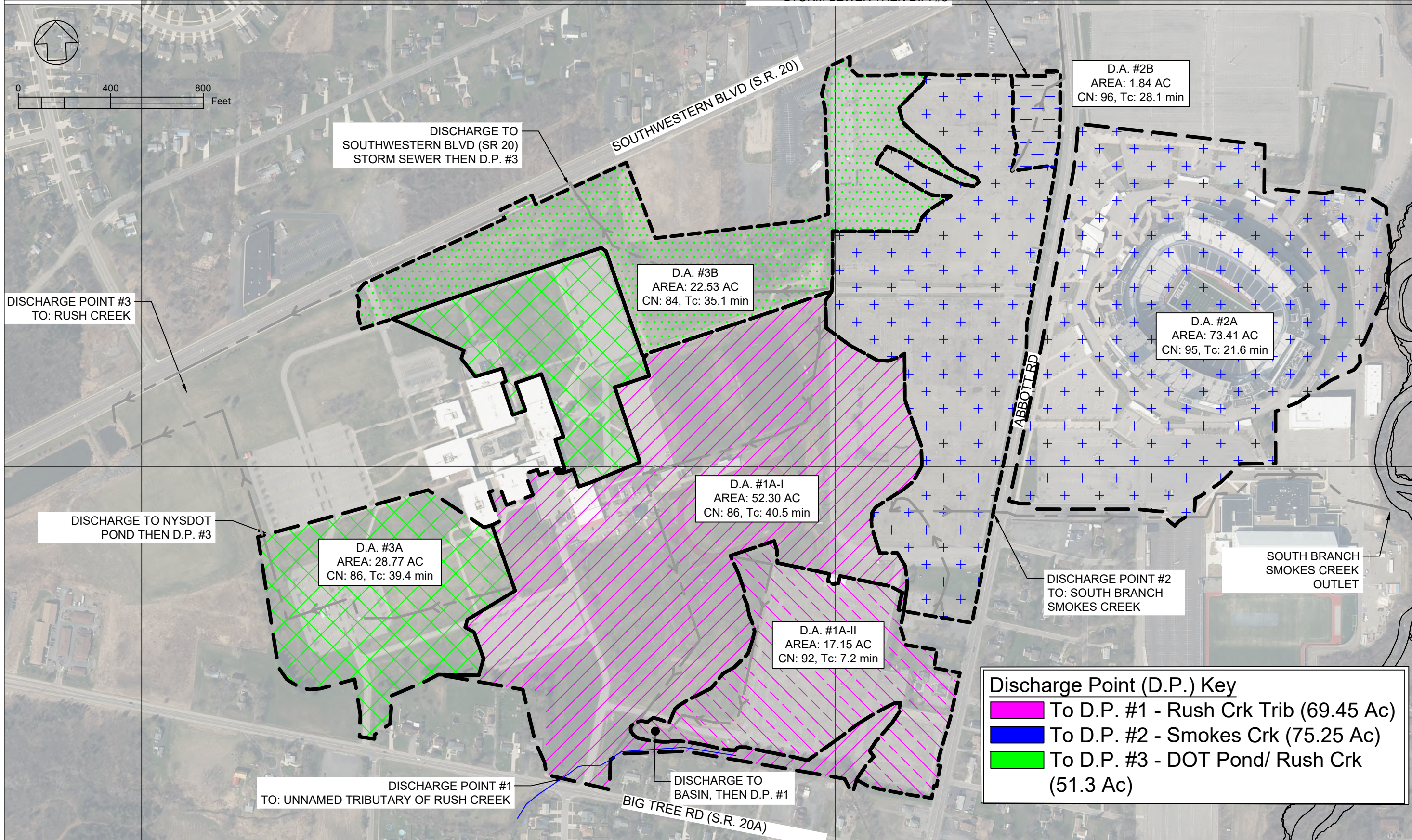
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

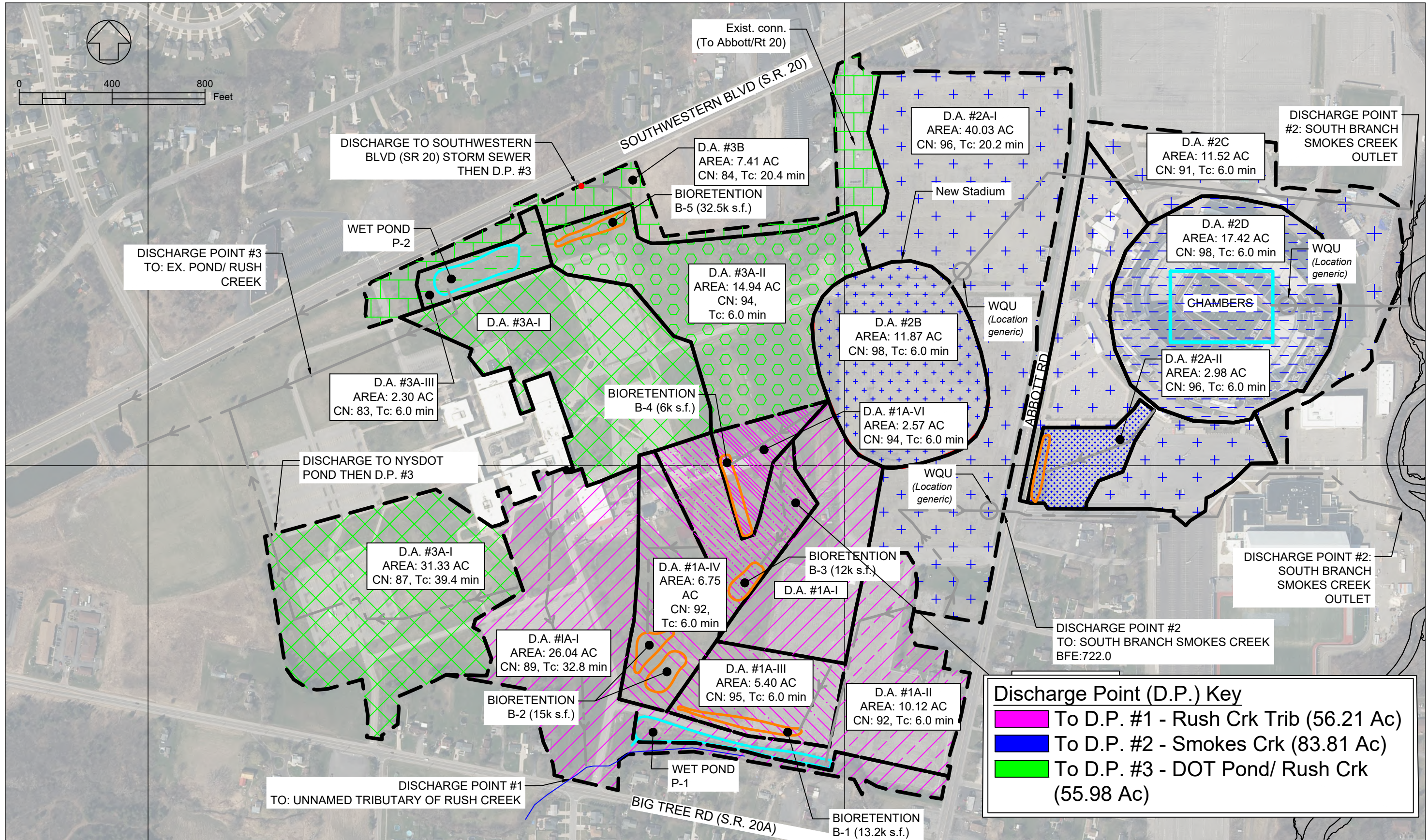
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/20/2022 at 5:07 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Bills Stadium - Existing Drainage Conditions Map

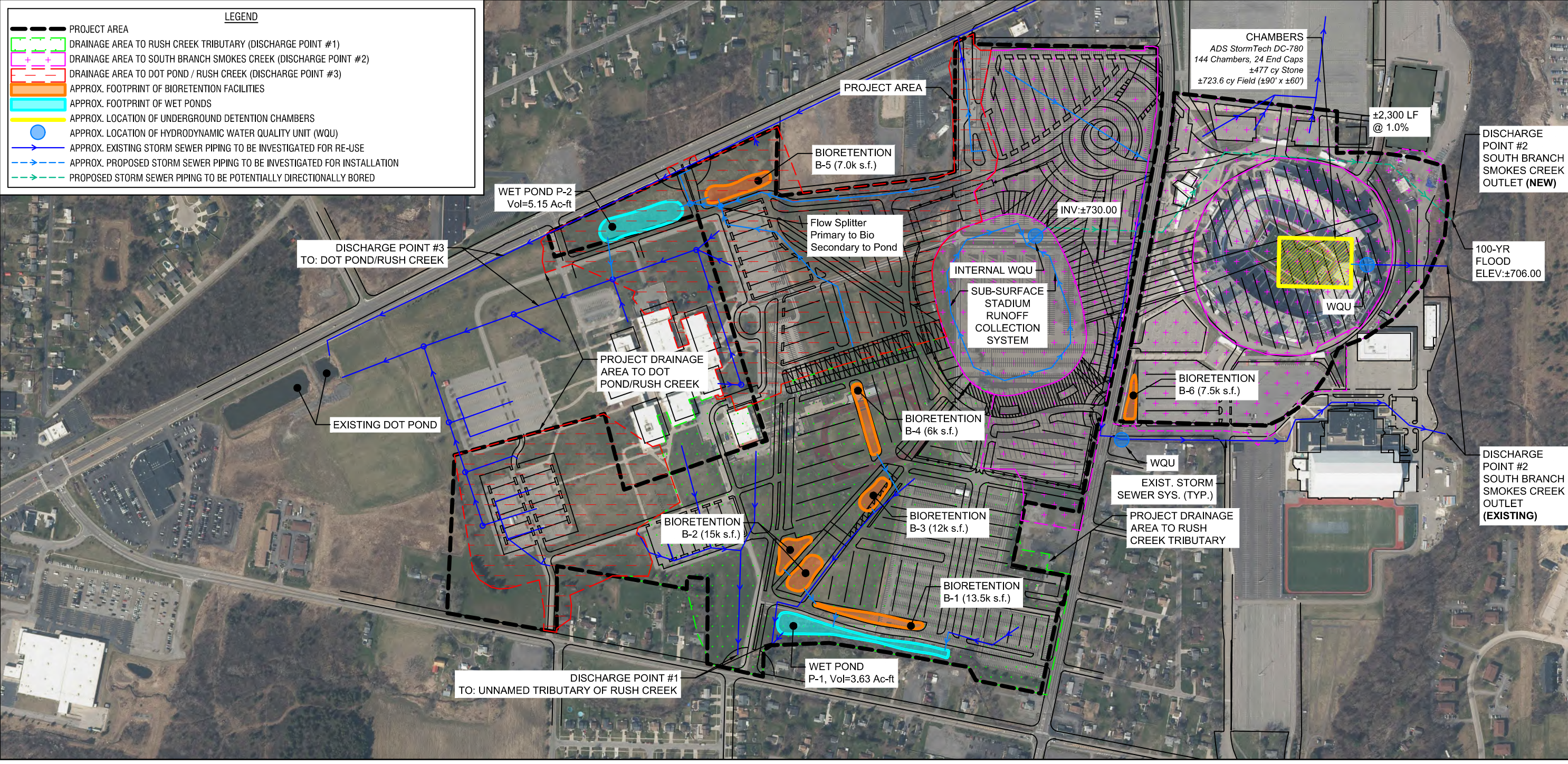


Bills Stadium - Proposed Drainage Conditions Map



LEGEND

- PROJECT AREA
- DRAINAGE AREA TO RUSH CREEK TRIBUTARY (DISCHARGE POINT #1)
- DRAINAGE AREA TO SOUTH BRANCH SMOKES CREEK (DISCHARGE POINT #2)
- DRAINAGE AREA TO DOT POND / RUSH CREEK (DISCHARGE POINT #3)
- APPROX. FOOTPRINT OF BIORETENTION FACILITIES
- APPROX. FOOTPRINT OF WET PONDS
- APPROX. LOCATION OF UNDERGROUND DETENTION CHAMBERS
- APPROX. LOCATION OF HYDRODYNAMIC WATER QUALITY UNIT (WQU)
- APPROX. EXISTING STORM SEWER PIPING TO BE INVESTIGATED FOR RE-USE
- APPROX. PROPOSED STORM SEWER PIPING TO BE INVESTIGATED FOR INSTALLATION
- PROPOSED STORM SEWER PIPING TO BE POTENTIALLY DIRECTIONALLY BORED



APPENDIX B

Permit Coverage Documents

CONTRACTOR IDENTIFICATION & CERTIFICATION

Prior to the commencement of construction activity and at the completion of the pre-construction meeting (if applicable), all contractors and subcontractors that will be responsible for installing, constructing, repairing, replacing, inspecting and/or maintaining the erosion and sediment control practices or constructing the post-construction stormwater management practices must complete this form. If new or additional contractors are hired to implement measures identified in the SWPPP after construction has commenced, they must also sign the forms. The completed forms shall be considered part of the SWPPP Report. Copies of the executed forms are to be included in the SWPPP that is maintained at the construction site and supplied to the owner per Section VII.A-E of the SWPPP.

Contractor:

| | | |
|--|---|--|
| Company Name: | | |
| Address: | | |
| City, State, Zip Code: | | |
| Telephone Number: | | |
| Description of Work Responsible Form: | | |
| Contact Name & Title: | | |
| Trained Contractor Certification*: | | |
| Contact Cell No.: | | |
| E-mail: | | |
| Certification: | <i>I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the more current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I am aware that there are significant penalties for submitting false information that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations.</i> | |
| Signature Indicating Review & Acceptance of Certification by Contact: | | |

**Attach copies of Trained Contractor Certification (NYSDEC Endorsed 4-Hr Training) to this form.*

Copies of this form may be made if additional Contractor's or certifications are needed.

NOI for coverage under Stormwater General Permit for Construction Activity

version 1.35

(Submission #: HPK-8R06-WNCS7, version 1)

Details

Originally Started By Sara Gilbert
Alternate Identifier New Bills Stadium
Submission ID HPK-8R06-WNCS7
Submission Reason New
Status Draft
Active Steps Form Submitted

Form Input

Owner/Operator Information

Owner/Operator Name (Company/Private Owner/Municipality/Agency/Institution, etc.)

Buffalo Bills

Owner/Operator Contact Person Last Name (NOT CONSULTANT)

D'Angelo

Owner/Operator Contact Person First Name

Kathryn

Owner/Operator Mailing Address

One Bills Drive

City

Orchard Park

State

NY

Zip

14127

Phone

716-312-8607

Email

Kathryn.d'angelo@bills.nfl.net

Federal Tax ID

NONE PROVIDED

Project Location

Project/Site Name

New Bills Stadium

Street Address (Not P.O. Box)

1 Bills Drive

Side of Street

West

City/Town/Village (THAT ISSUES BUILDING PERMIT)

Erie County

State

NY

Zip

14127

DEC Region

9

County

ERIE

Name of Nearest Cross Street

Abbott Road

Distance to Nearest Cross Street (Feet)

0

Project In Relation to Cross Street

West

Tax Map Numbers Section-Block-Parcel
NONE PROVIDED**Tax Map Numbers**
Too long to list**1. Coordinates**

Provide the Geographic Coordinates for the project site. The two methods are:

- Navigate to the project location on the map (below) and click to place a marker and obtain the XY coordinates.
- The "Find Me" button will provide the lat/long for the person filling out this form. Then pan the map to the correct location and click the map to place a marker and obtain the XY coordinates.

Navigate to your location and click on the map to get the X,Y coordinates
42.772249208410706,-78.79156284078368

Project Details

2. What is the nature of this project?
Redevelopment with increase in impervious area

3. Select the predominant land use for both pre and post development conditions.

Pre-Development Existing Landuse
Recreational/Sports Field

Post-Development Future Land Use
Recreational/Sports Field

3a. If Single Family Subdivision was selected in question 3, enter the number of subdivision lots.
NONE PROVIDED

4. In accordance with the larger common plan of development or sale, enter the total project site acreage, the acreage to be disturbed and the future impervious area (acreage)within the disturbed area.

*** ROUND TO THE NEAREST TENTH OF AN ACRE. ***

Total Site Area (acres)
284

Total Area to be Disturbed (acres)
181.20

Existing Impervious Area to be Disturbed (acres)

96.0

Future Impervious Area Within Disturbed Area (acres)

130.9

5. Do you plan to disturb more than 5 acres of soil at any one time?

Yes

6. Indicate the percentage (%) of each Hydrologic Soil Group(HSG) at the site.**A (%)**

0

B (%)

0

C (%)

6

D (%)

94

7. Is this a phased project?

Yes

8. Enter the planned start and end dates of the disturbance activities.**Start Date**

01/01/2023

End Date

12/31/2026

9. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge.

South Branch of Smokes Creek, Unnamed Tributary of Rush Creek & Rush Creek

9a. Type of waterbody identified in question 9?

Stream/Creek Off Site

Stream/Creek On Site

Other Waterbody Type Off Site Description

Smokes Creek & Rush Creek are offsite, Rush Creek Trib. is onsite

9b. If "wetland" was selected in 9A, how was the wetland identified?

NONE PROVIDED

10. Has the surface waterbody(ies in question 9 been identified as a 303(d) segment in Appendix E of GP-0-20-001?

Yes

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-20-001?

No

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters?

No

If No, skip question 13.

13. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as D (provided the map unit name is inclusive of slopes greater than 25%), E or F on the USDA Soil Survey?

No

If Yes, what is the acreage to be disturbed?

NONE PROVIDED

14. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area?

No

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)?

Yes

16. What is the name of the municipality/entity that owns the separate storm sewer system?

NYSDOT

17. Does any runoff from the site enter a sewer classified as a Combined Sewer?

No

18. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law?

No

19. Is this property owned by a state authority, state agency, federal government or local government?

Yes

20. Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.)

No

Required SWPPP Components

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)?

Yes

22. Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)?

Yes

If you answered No in question 22, skip question 23 and the Post-construction Criteria and Post-construction SMP Identification sections.

23. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual?

Yes

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:
Professional Engineer (P.E.)

SWPPP Preparer

Pinewoods Engineering, P.C.

Contact Name (Last, Space, First)

Gilbert Sara

Mailing Address

42 Aston Villa

City

North Chili

State

NY

Zip

14514

Phone

585-261-7852

Email

sgilbert@pinewoodseng.com

Download SWPPP Preparer Certification Form

Please take the following steps to prepare and upload your preparer certification form:

1) Click on the link below to download a blank certification form

- 2) The certified SWPPP preparer should sign this form
- 3) Scan the signed form
- 4) Upload the scanned document

[Download SWPPP Preparer Certification Form](#)

Please upload the SWPPP Preparer Certification

NONE PROVIDED

Comment

NONE PROVIDED

Erosion & Sediment Control Criteria

25. Has a construction sequence schedule for the planned management practices been prepared?

Yes

26. Select all of the erosion and sediment control practices that will be employed on the project site:

Temporary Structural

Check Dams
 Dust Control
 Sediment Basin
 Sediment Traps
 Silt Fence
 Stabilized Construction Entrance
 Storm Drain Inlet Protection
 Temporary Stormdrain Diversion
 Temporary Swale

Biotechnical

None

Vegetative Measures

Protecting Vegetation
 Seeding
 Streambank Protection
 Temporary Swale
 Topsoiling

Permanent Structural

Land Grading
 Rock Outlet Protection

Other

NONE PROVIDED

Post-Construction Criteria

*** IMPORTANT: Completion of Questions 27-39 is not required if response to Question 22 is No.**

27. Identify all site planning practices that were used to prepare the final site plan/layout for the project.

Preservation of Buffers
Locating Development in Less Sensitive Areas
Reduction of Clearing and Grading
Preservation of Undisturbed Area

27a. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6("Soil Restoration") of the Design Manual (2010 version).

All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual (see page 5-22).

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout). (Acre-feet)

7.621

29. Post-construction SMP Identification

Use the Post-construction SMP Identification section to identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRv Capacity that were used to reduce the Total WQv Required (#28).

Identify the SMPs to be used by providing the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

Note: Redevelopment projects shall use the Post-Construction SMP Identification section to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs.

30. Indicate the Total RRv provided by the RR techniques (Area/Volume Reduction) and Standard SMPs with RRv capacity identified in question 29. (acre-feet)

0.658

31. Is the Total RRv provided (#30) greater than or equal to the total WQv required (#28)?

No

If Yes, go to question 36. If No, go to question 32.

32. Provide the Minimum RRv required based on HSG. [Minimum RRv Required = (P) (0.95) (Ai) / 12, Ai=(s) (Aic)] (acre-feet)

0.478

32a. Is the Total RRv provided (#30) greater than or equal to the Minimum RRv Required (#32)?

Yes

If Yes, go to question 33.

Note: Use the space provided in question #39 to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). A detailed evaluation of the specific site limitations and justification for not reducing 100% of the WQv required (#28) must also be included in the SWPPP.

If No, sizing criteria has not been met; therefore, NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

33. SMPs

Use the Post-construction SMP Identification section to identify the Standard SMPs and, if applicable, the Alternative SMPs to be used to treat the remaining total WQv (=Total WQv Required in #28 - Total RRv Provided in #30).

Also, provide the total impervious area that contributes runoff to each practice selected.

NOTE: Use the Post-construction SMP Identification section to identify the SMPs used on Redevelopment projects.

33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in question #29. (acre-feet)

0.658

Note: For the standard SMPs with RRv capacity, the WQv provided by each practice = the WQv calculated using the contributing drainage area to the practice - provided by the practice. (See Table 3.5 in Design Manual)

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a).

7.710

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)?

Yes

If Yes, go to question 36.

If No, sizing criteria has not been met; therefore, NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

36. Provide the total Channel Protection Storage Volume (CPv required and provided or select waiver (#36a), if applicable.**CPv Required (acre-feet)**

2.097

CPv Provided (acre-feet)

2.743

36a. The need to provide channel protection has been waived because:

NONE PROVIDED

37. Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria or select waiver (#37a), if applicable.**Overbank Flood Control Criteria (Qp)****Pre-Development (CFS)**

319.89

Post-Development (CFS)

263.17

Total Extreme Flood Control Criteria (Qf)**Pre-Development (CFS)**

607.60

Post-Development (CFS)

541.90

37a. The need to meet the Qp and Qf criteria has been waived because:

NONE PROVIDED

38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed?

Yes

If Yes, Identify the entity responsible for the long term Operation and Maintenance

Buffalo Bills

39. Use this space to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). (See question #32a) This space can also be used for other pertinent project information.

The site is comprised mostly of HSG D soils which are not conducive to infiltration practices from large impervious areas. The site also has shallow depth to groundwater and bedrock in the northern portions of the site. To reduce the extents of the disturbance, existing storm sewer infrastructure is re-used to the greatest extent possible which limits the head depth available for certain practices.

Post-Construction SMP Identification**Runoff Reduction (RR) Techniques, Standard Stormwater Management Practices (SMPs) and Alternative SMPs**

Identify the Post-construction SMPs to be used by providing the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

RR Techniques (Area Reduction)

Round to the nearest tenth

Total Contributing Acres for Conservation of Natural Area (RR-1)

NONE PROVIDED

Total Contributing Impervious Acres for Conservation of Natural Area (RR-1)

NONE PROVIDED

Total Contributing Acres for Sheetflow to Riparian Buffers/Filter Strips (RR-2)

NONE PROVIDED

Total Contributing Impervious Acres for Sheetflow to Riparian Buffers/Filter Strips (RR-2)

NONE PROVIDED

Total Contributing Acres for Tree Planting/Tree Pit (RR-3)

NONE PROVIDED

Total Contributing Impervious Acres for Tree Planting/Tree Pit (RR-3)

NONE PROVIDED

Total Contributing Acres for Disconnection of Rooftop Runoff (RR-4)

NONE PROVIDED

RR Techniques (Volume Reduction)

Total Contributing Impervious Acres for Disconnection of Rooftop Runoff (RR-4)

NONE PROVIDED

Total Contributing Impervious Acres for Vegetated Swale (RR-5)

NONE PROVIDED

Total Contributing Impervious Acres for Rain Garden (RR-6)

NONE PROVIDED

Total Contributing Impervious Acres for Stormwater Planter (RR-7)

NONE PROVIDED

Total Contributing Impervious Acres for Rain Barrel/Cistern (RR-8)

NONE PROVIDED

Total Contributing Impervious Acres for Porous Pavement (RR-9)

NONE PROVIDED

Total Contributing Impervious Acres for Green Roof (RR-10)
NONE PROVIDED

Standard SMPs with RRv Capacity

Total Contributing Impervious Acres for Infiltration Trench (I-1)
NONE PROVIDED

Total Contributing Impervious Acres for Infiltration Basin (I-2)
NONE PROVIDED

Total Contributing Impervious Acres for Dry Well (I-3)
NONE PROVIDED

Total Contributing Impervious Acres for Underground Infiltration System (I-4)
NONE PROVIDED

Total Contributing Impervious Acres for Bioretention (F-5)
36.26

Total Contributing Impervious Acres for Dry Swale (O-1)
NONE PROVIDED

Standard SMPs

Total Contributing Impervious Acres for Micropool Extended Detention (P-1)
NONE PROVIDED

Total Contributing Impervious Acres for Wet Pond (P-2)
34.07

Total Contributing Impervious Acres for Wet Extended Detention (P-3)
NONE PROVIDED

Total Contributing Impervious Acres for Multiple Pond System (P-4)
NONE PROVIDED

Total Contributing Impervious Acres for Pocket Pond (P-5)
NONE PROVIDED

Total Contributing Impervious Acres for Surface Sand Filter (F-1)
NONE PROVIDED

Total Contributing Impervious Acres for Underground Sand Filter (F-2)
NONE PROVIDED

Total Contributing Impervious Acres for Perimeter Sand Filter (F-3)
NONE PROVIDED

Total Contributing Impervious Acres for Organic Filter (F-4)

NONE PROVIDED

Total Contributing Impervious Acres for Shallow Wetland (W-1)

NONE PROVIDED

Total Contributing Impervious Acres for Extended Detention Wetland (W-2)

NONE PROVIDED

Total Contributing Impervious Acres for Pond/Wetland System (W-3)

NONE PROVIDED

Total Contributing Impervious Acres for Pocket Wetland (W-4)

NONE PROVIDED

Total Contributing Impervious Acres for Wet Swale (O-2)

NONE PROVIDED

Alternative SMPs (DO NOT INCLUDE PRACTICES BEING USED FOR PRETREATMENT ONLY)

Total Contributing Impervious Area for Hydrodynamic

42.67

Total Contributing Impervious Area for Wet Vault

NONE PROVIDED

Total Contributing Impervious Area for Media Filter

NONE PROVIDED

"Other" Alternative SMP?

NONE PROVIDED

Total Contributing Impervious Area for "Other"

NONE PROVIDED

Provide the name and manufacturer of the alternative SMPs (i.e. proprietary practice(s)) being used for WQv treatment.

Note: Redevelopment projects which do not use RR techniques, shall use questions 28, 29, 33 and 33a to provide SMPs used, total WQv required and total WQv provided for the project.

Manufacturer of Alternative SMP

To Be Determined

Name of Alternative SMP

To Be Determined

Other Permits

40. Identify other DEC permits, existing and new, that are required for this project/facility.

None

If SPDES Multi-Sector GP, then give permit ID

NONE PROVIDED

If Other, then identify

NONE PROVIDED

41. Does this project require a US Army Corps of Engineers Wetland Permit?

No

If "Yes," then indicate Size of Impact, in acres, to the nearest tenth

NONE PROVIDED

42. If this NOI is being submitted for the purpose of continuing or transferring coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned.

NONE PROVIDED

MS4 SWPPP Acceptance

43. Is this project subject to the requirements of a regulated, traditional land use control MS4?

Yes - Please attach the MS4 Acceptance form below

If No, skip question 44

44. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI?

Yes

MS4 SWPPP Acceptance Form Download

Download form from the link below. Complete, sign, and upload.

[MS4 SWPPP Acceptance Form](#)

MS4 Acceptance Form Upload

NONE PROVIDED

Comment

NONE PROVIDED

Owner/Operator Certification

Owner/Operator Certification Form Download

Download the certification form by clicking the link below. Complete, sign, scan, and upload the form.

[Owner/Operator Certification Form \(PDF, 45KB\)](#)

Upload Owner/Operator Certification Form

NONE PROVIDED

Comment

NONE PROVIDED

Status History

| | User | Processing Status |
|----------------------|--------------|-------------------|
| 7/18/2022 9:18:51 AM | Sara Gilbert | Draft |

Processing Steps

| Step Name | Assigned To/Completed By | Date Completed |
|----------------|--------------------------|----------------|
| Form Submitted | | |
| Under Review | DAVID GASPER | |
| Under Review | Daniel von Schilgen | |



Owner/Operator Certification Form

SPDES General Permit For Stormwater Discharges From Construction Activity (GP-0-20-001)

Project/Site Name: _____

eNOI Submission Number: _____

eNOI Submitted by: Owner/Operator SWPPP Preparer Other

Certification Statement - Owner/Operator

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Kathryn
Owner/Operator First Name

D'Angelo
M.I. Last Name

Signature

Date



SWPPP Preparer Certification Form

*SPDES General Permit for Stormwater
Discharges From Construction Activity
(GP-0-20-001)*

Project Site Information Project/Site Name

Owner/Operator Information Owner/Operator (Company Name/Private Owner/Municipality Name)

Certification Statement – SWPPP Preparer

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-20-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First name

MI

Last Name

Signature

Date



Department of
Environmental
Conservation

NYS Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

**MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance
Form**

for

Construction Activities Seeking Authorization Under SPDES General Permit

*(NOTE: Attach Completed Form to Notice Of Intent and Submit to Address Above)

I. Project Owner/Operator Information

1. Owner/Operator Name:

2. Contact Person:

3. Street Address:

4. City/State/Zip:

II. Project Site Information

5. Project/Site Name:

6. Street Address:

7. City/State/Zip:

III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information

8. SWPPP Reviewed by:

9. Title/Position:

10. Date Final SWPPP Reviewed and Accepted:

IV. Regulated MS4 Information

11. Name of MS4:

12. MS4 SPDES Permit Identification Number: NYR20A

13. Contact Person:

14. Street Address:

15. City/State/Zip:

16. Telephone Number:

MS4 SWPPP Acceptance Form - continued

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 5 has been reviewed and meets the substantive requirements in the SPDES General Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s). Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name:

Title/Position:

Signature:

Date:

VI. Additional Information

Date: _____

Addressed to MS4
Address Line 1
Address Line 2

RE: New Bills Stadium, 1 Bills Drive
Request to Disturb Greater Than 5-Acres

Dear MS4 Officer,

Part II.C.3 of the SPDEs General Permit for Stormwater Discharges from Construction Activity, requires written authorization from the MS4 prior to disturbing more than 5 Acres of soil. This letter serves as an official request for this authorization.

- A Qualified Inspector will conduct at least 2 site inspections every 7 calendar days whenever more than 5-Acres of soil has been disturbed. Inspections during this period will be separated by a minimum of 2 full calendar days.
- In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures will be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased.
- A phasing plan is included within the Construction documents that defines the maximum disturbed area per phase and shows required cuts and fills.
- The erosion and sediment control plans and SWPPP have been designed for a disturbance greater than 5-Acres however, the owner agrees to install any additional practices needed to protect water quality.
- A copy of this letter (once executed) will be retained within the SWPPP that is kept on-site. These requirements that apply when greater than 5-Acres of soil is disturbed are included in the project SWPPP.

If you agree to authorize greater than 5-Acres of soil to be disturbed, please sign below;

| | |
|------------|--|
| Signature: | |
| Name: | |
| Title: | |
| Town: | |
| Phone: | |
| E-mail: | |

Sincerely,

APPENDIX C

Permit Termination Documents

APPENDIX D

Calculations & HydroCAD Reports



Limits of Disturbance Calculations

I. Existing Site Ground Delineation:

| Ground Cover | HSG | Area (Ac) |
|--------------------|-----|-----------|
| Asphalt/Conc | C | 20.61 |
| Asphalt/Conc | D | 110.27 |
| Total Asphalt/Conc | | 130.89 |
| Lawn Good | C | 1.80 |
| Lawn Good | D | 46.15 |
| Total Lawn | | 47.94 |
| Gravel Surface | D | 0.15 |
| Woods Good | D | 2.23 |

Total Disturbance Area: 181.20

Existing Impervious Area on Site: 53%

II. Existing Soils:

| | |
|--------|-----|
| HSG A: | 0% |
| HSG B: | 0% |
| HSG C: | 12% |
| HSG D: | 88% |

III. Proposed Site Ground Delineation:

| Ground Cover | HSG | Area (Ac) |
|--------------------|-----|-----------|
| Asphalt/Conc | C | 20.61 |
| Asphalt/Conc | D | 110.27 |
| Total Asphalt/Conc | | 130.89 |
| Lawn Good | C | 1.80 |
| Lawn Good | D | 46.15 |
| Total Lawn | | 47.94 |
| Gravel Surface | D | 0.15 |
| Woods Good | D | 2.23 |

Total Disturbance Area: 181.20

Proposed Impervious Area on Site: 72%

IV. Existing Vs. Proposed Comparison

| | |
|----------------------------------|-----------|
| Existing Impervious Area: | 95.98 Ac |
| Removed Impervious Area: | 8.70 Ac |
| <hr/> | |
| Exist. Imperv.to Remain: | 87.29 Ac |
| | |
| Exist. Imperv. To Remain: | 87.29 Ac |
| New Imperv. Area: | 43.66 Ac |
| <hr/> | |
| Proposed Imperv. Area: | 130.95 Ac |

Required Water Quality Volume (WQv) Calculations

Discharge Point #1

I. Project Delineation

Project Delineation - By Drainage Area (D.A.)

| Classification | Drainage Area (Ac) | Impervious Area in D.A. (Ac) | % Imp. | Rv | Exist. WQv Provd'd (Ac-ft) |
|--|--------------------|------------------------------|--------|------|----------------------------|
| New Development | 16.000 | 15.998 | 100% | 0.95 | - |
| Redevelopment <i>(Without existing WQv provided)</i> | 40.205 | 19.532 | 49% | 0.49 | - |
| Redevelopment <i>(With Existing WQv provided in a standard practice)</i> | N/A | N/A | - | - | N/A |
| Total | 56.205 | 35.530 | - | - | - |

Project Delineation - By Limits of Disturbance (LOD)

| Classification | LOD Area (Ac) | Impervious Area in LOD (Ac) | % Imp. | Rv | Exist. WQv Provd'd (Ac-ft) |
|--|---------------|-----------------------------|--------|-------|----------------------------|
| New Development | 16.000 | 15.998 | 99.99% | 0.95 | - |
| Redevelopment <i>(Without existing WQv provided)</i> | 36.773 | 17.468 | 47.50% | 0.478 | - |
| Redevelopment <i>(With Existing WQv provided in an alternative practice)</i> | 0.000 | 0.000 | - | - | N/A |
| Total | 52.773 | 33.466 | - | - | - |

II. New Development Areas - Required WQv

| | |
|--|-----------|
| Project located in an Enhanced Phosphorus Removal Area? | NO |
|--|-----------|

From Chapter 4: New York State Stormwater Management Design Manual:

Table 4.1 New York State Sizing Criteria

90% Rule:

$$\text{WQv (initial)} = \frac{(P)(Rv)(A)}{12}$$

Where:

| | | |
|-----------------------------|------|--------|
| $Rv = 0.05 + 0.009 * I(\%)$ | Rv = | 0.950 |
| A = New Develop't D.A. (Ac) | A = | 16.000 |
| P = 90% Rainfall (in) | P = | 1.00 |

| | | |
|--|---------------|-----------|
| Required WQv for New Development: | 55,169 | cf |
|--|---------------|-----------|

III. WQv/RRv Provided By Area Reduction Practices & Rooftop Disconnect

| Practice | Contributing Area (Ac) | Contributing Imp. Area (Ac) | Notes |
|---------------------------|------------------------|-----------------------------|-------------------|
| Conserv. Of Natural Areas | | | Min. 10k S.F. |
| Riparian Buffers | | | Max. Lth: 75-150' |
| Filter Strips | | | |
| Tree Planting | | | 100sf imperv/tree |
| Total | 0.00 | 0.00 | |

Recalculate WQv after application of Area Reduction Techniques

| Calc. Step | Total Area (Ac) | Imp. Area (Ac) | Percent Imp. (%) | Runoff Coeff. Rv | WQv (cf) |
|---------------------|-----------------|----------------|------------------|------------------|----------|
| Initial WQv | 16.00 | 16.00 | 99.99% | 0.95 | 55169 |
| Subtract Area | 0.00 | 0.00 | | | |
| Adjusted WQv | 16 | 16.00 | 99.99% | 0.95 | 55169 |
| Disconn. Of Rf Tops | | 0.00 | | | |
| Total Adjusted | 16 | 16.00 | 99.99% | 0.95 | 55169 |
| WQv Reduced | | | | | 0 |

Area Reduction Practices and Rooftop Disconnect Not Used To Provide WQv/RRv

WQv/RRv Prvd'd By Area Reduc. Prac. & Rftop Disconnt: 0 cf

IV. WQv/RRv Provided By Volume Reduction Practices

| Practice | Contributing Area (Ac) | Contributing Imp. Area (Ac) | RRv Applied (cf) |
|---------------------|------------------------|-----------------------------|------------------|
| Vegetated Swale | - | - | - |
| Rain Garden | - | - | - |
| Stormwater Planter | - | - | - |
| Rain Barrel/Cistern | - | - | - |
| Porous Pavement | - | - | - |
| Green Roof | - | - | - |
| Total | - | - | - |

Volume Reduction Practices Not Use to Provide WQv/RRv

WQv/RRv Prvd'd By Volume Reduc. Prac.: 0 cf

V. WQv Provided By Standard Practices

| Practice | Drainage Area (Ac) | Imp. Area (Ac) | RRv Prvd'd (cf) | WQv Prvd'd (Non RRv) (cf) | Total WQv Prvd'd (cf) |
|---------------------------------|--------------------|----------------|-----------------|---------------------------|-----------------------|
| Infiltration Trench | - | - | - | - | - |
| Infiltration Basin | - | - | - | - | - |
| Dry Well | - | - | - | - | - |
| Underground Infiltration | - | - | - | - | - |
| Bioretention & Infiltration Bio | 30.161 | 22.088 | 21696 | 31944 | 53640 |
| Dry Swale | - | - | - | - | - |
| Micropool Extended Det. (P-1) | - | - | - | - | - |
| Wet Pond (P-2) | 40.277 | 28.871 | 0 | 4500 | 4500 |
| Wet Extended Det. (P-3) | - | - | - | - | - |
| Multiple Pond System (P-4) | - | - | - | - | - |
| Pocket Pond (P-5) | - | - | - | - | - |
| Surface Sand Filter (F-3) | - | - | - | - | - |
| Perimeter Sand Filter (F-3) | - | - | - | - | - |
| Organic Filter (F-4) | - | - | - | - | - |
| Shallow Wetland (W-1) | - | - | - | - | - |
| Extended Det. Wetland (W-2) | - | - | - | - | - |
| Pond/Wetland System (W-3) | - | - | - | - | - |
| Pocket Wetland (W-4) | - | - | - | - | - |
| Wet Swale (O-2) | - | - | - | - | - |
| Total | 70.438 | 50.959 | 21696 | 36444 | 58140 |

WQv Provided By Standard Practices: 58,140 cf

VI. Total WQv Required/Provided By Standard Practices

New Developmnt WQv Req'd To Be Provided in a Standard Practice: 55,169 cf (Part II.)

| Standard Practice | WQv Provd'd (cf) | |
|--------------------------------|------------------|-------------|
| Area Reduction & Roof Disconn. | 0 | (Part III.) |
| Volume Reduction | 0 | (Part IV.) |
| Standard Practices | 58140 | (Part V.) |
| Total | 58140 | |

Provd'd WQv in Stndrd Prac. Meets/Exceeds Required? YES

Excess WQv Provided: 2,970 cf

(This Volume May Be Applied To Meeting Redevelopment WQv Requirements Where Applicable)

VII. Redevelopment Areas - Required Water Quality Volume

Based on Chapter 9 Redevelopment Standards

| | |
|--|-----------|
| Project located in an Enhanced Phosphorus Removal Area? | NO |
|--|-----------|

Table 4.1 New York State Sizing Criteria

| | | |
|--|-----------------------------|------------|
| 90% Rule: | Where: | |
| $\text{WQv (initial)} = \frac{(P)(Rv)(A)}{12}$ | $Rv = 0.05 + 0.009 * I(\%)$ | Rv = 0.478 |
| | A = Redevelopment LOD(Ac) | A = 36.773 |
| | P = 90% Rainfall (in) | P = 1.00 |

| | | |
|--|---------------|-----------|
| Initial Required WQv for Redevelopment: | 63,742 | cf |
|--|---------------|-----------|

Water Quality Volume Provided Through Impervious Cover Reduction

| | | |
|--|-------|----|
| Existing Impervious Cover in LOD/Redevelopment Area: | 16.24 | Ac |
| Removed Impervious Cover: | -5.13 | Ac |
| Existing Impervious Cover in LOD/Redev. Remaining: | 11.11 | Ac |

| | |
|---|--------------|
| Percentage of Exist. Impervious Cvr Removed: | 31.6% |
|---|--------------|

| |
|--|
| <i>Impervious Cover Reduction Meets or Exceeds 25% and Therefore Meets Redevelopment WQv Requirements. No Additional Practices Required</i> |
|--|

WQv Provided Through Standard Practices Which May Be Applied to Redevelopment

Excess WQv Provided in Standard Practice: 2970 cf (Part VI.)

| | |
|---|-------------|
| Stndrd Prac. WQv as % of Initial WQv for Redevelop.: | 4.7% |
|---|-------------|

Total Standard Practice WQv & Impervious Cover Reduction

| | | |
|-------|--|-------------|
| 31.6% | Percentage of Exist. Impervious Cvr Removed: | %ICR |
| 4.7% | Stndrd Prac. WQv as % of Initial WQv for Redevelop.: | %RRv & %WQv |
| 36.2% | Total %RRv & %ICR & %WQv | |

| |
|--|
| <i>Impervious Cover Reduction and WQv Provided in Standard Practices is Greater Than 25% and Therefore Fully Meet Redevelopment WQv Requirements. No Further Practices Needed</i> |
|--|

Total WQv Required To Be Provided in an Alternative Practice

36.2% :WQv Provd'd through Imp. Cover Reduction & Stndrd Prac.'s (%RRv & %ICR & %WQv)

$$\text{WQv (Alternative Prac.)} = \text{WQv Initial/Redevelopment} \times \left(\frac{25 - \%RRv - \%ICR - \%WQv}{100} \times 3 \right)$$

$$\begin{array}{r} 25 \\ -36.2 \quad \%RRv/\%ICR/\%WQv \\ \hline -11.2 \\ \times \quad 3 \\ \hline 0\% \end{array}$$

0.0% of Initial WQv/Redevelopment To Be Provided in an Alternative Practice

- cf of WQv Required To Be Provided in an Alternative Practice

VIII. Total Water Quality Volume Provided by Alternative Practices

Alternative Practices are Not Used to Meet Redevelopment WQv Requirements

Total WQv Provided with Alternative Practices: 0 cf

IX. Total WQv Required Summary

| Project Classification | WQv Method | Req'r'd WQv (cf) | Req'r'd WQv (cf) | Req'r'd WQv (Ac-ft) |
|------------------------|-------------|------------------|------------------|---------------------|
| New Development | Standard | 55,169 | 55,169 | 1.267 |
| Redevelopment | Imp. Remvl | 15,936 | 15,936 | 0.366 |
| | Standard | 0 | | |
| | Alternative | 0 | | |
| Total | - | 71,105 | 71,105 | 1.632 |

X. Total WQv Provided Summary

| Project Classification | WQv Method | Provd'd WQv (cf) | Provd'd WQv (cf) | Provd'd WQv (Ac-ft) |
|------------------------|-------------|------------------|------------------|---------------------|
| New Development | Standard | 55,169 | 55,169 | 1.267 |
| Redevelopment | Imp. Remvl | 15,936 | 18,906 | 0.434 |
| | Standard | 2,970 | | |
| | Alternative | 0 | | |
| Total | - | 74,075 | 74,075 | 1.701 |

Provided WQv Meets/Exceeds Required WQv? YES

Minimum Required & Provided RRv Calculations
Design Point #1

Enter the Soils Data for the site

| Soil Group | Acres | S | |
|------------|-------|-----|-------------------------------|
| A | 0.00 | 55% | |
| B | 0.00 | 40% | |
| C | 0.00 | 30% | |
| D | 16.00 | 20% | <i>(New Development Only)</i> |
| Total Area | 16.00 | | |

Calculate the Minimum RRv

| | | |
|--------------------|---------------|------------------------------|
| S = | 0.2 | |
| Impervious = | 15.998 | <i>acre</i> |
| Precipitation | 1 | <i>in</i> |
| Rv | 0.95 | |
| Minimum RRv | 11,034 | <i>ft³</i> |
| | 0.253 | <i>af</i> |

| Drainage Area | Practice | Practice Name | Total Area | Imp. Area | RRv Provided (cf) | RRv Provided (Ac-ft) |
|---------------|--------------|---------------|------------|-----------|-------------------|----------------------|
| D.A. #1A-III | Bioretention | B-1 | 5.40 | 4.52 | 6,336 | 0.145 |
| D.A. #1A-IV | Bioretention | B-2 | 6.75 | 4.67 | 6,720 | 0.154 |
| D.A. #1A-V | Bioretention | B-3 | 5.32 | 4.09 | 5,760 | 0.132 |
| D.A. #1A-VI | Bioretention | B-4 | 2.57 | 2.03 | 2,880 | 0.066 |
| D.A. #1A-II | Wet Pond | P-1 | 10.12 | 6.78 | - | - |
| | | | | | | |
| Total | | | 20.05 | 15.31 | 21,696 | 0.498 |

RRv Provided Exceeds Minimum RRv? Yes

Is this project subject to Chapter 10 of the NYS Design Manual (i.e. WQv is equal to post-development 1 year runoff volume)?..... **No**

| | | | |
|---------------|------|------|---|
| Design Point: | 1 | | <i>Manually enter P, Total Area and Impervious Cover.</i> |
| P= | 1.00 | inch | |

Breakdown of Subcatchments

| Catchment Number | Total Area (Acres) | Impervious Area (Acres) | Percent Impervious % | Rv | WQv (ft ³) | Description |
|------------------|--------------------|-------------------------|----------------------|------|------------------------|--------------------|
| 1 | 5.40 | 4.52 | 84% | 0.80 | 15,744 | DA: 1A-III to B-1 |
| 2 | 6.75 | 4.67 | 69% | 0.67 | 16,475 | DA: 1A-IV to B-2 |
| 3 | 5.32 | 4.09 | 77% | 0.74 | 14,321 | DA: 1A-V to B-3 |
| 4 | 2.57 | 2.03 | 79% | 0.76 | 7,099 | DA: 1A-VI to B-4 |
| 5 | 10.12 | 6.78 | 67% | 0.65 | 23,996 | DA:1A-II to P-1 |
| 6 | 26.04 | 13.44 | 52% | 0.51 | 48,642 | DA:1A-I |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |
| Subtotal (1-30) | 56.21 | 35.53 | 63% | 0.62 | 126,278 | Subtotal 1 |
| Total | 56.21 | 35.53 | 63% | 0.62 | 126,278 | Initial WQv |

2.90 af

Identify Runoff Reduction Techniques By Area

| Technique | Total Contributing Area | Contributing Impervious Area | Notes |
|-------------------------------|-------------------------|------------------------------|--|
| | (Acre) | (Acre) | |
| Conservation of Natural Areas | 0.00 | 0.00 | minimum 10,000 sf |
| Riparian Buffers | 0.00 | 0.00 | maximum contributing length 75 feet to 150 feet |
| Filter Strips | 0.00 | 0.00 | |
| Tree Planting | 0.00 | 0.00 | Up to 100 sf directly connected impervious area may be subtracted per tree |
| Total | 0.00 | 0.00 | |

Recalculate WQv after application of Area Reduction Techniques

| | Total Area (Acres) | Impervious Area (Acres) | Percent Impervious % | Runoff Coefficient Rv | WQv (ft ³) |
|--|--------------------|-------------------------|----------------------|-----------------------|------------------------|
| "<<Initial WQv" | 56.21 | 35.53 | 63% | 0.62 | 126,278 |
| Subtract Area | 0.00 | 0.00 | | | |
| WQv adjusted after Area Reductions | 56.21 | 35.53 | 63% | 0.62 | 126,278 |
| Disconnection of Rooftops | | 0.00 | | | |
| Adjusted WQv after Area Reduction and Rooftop Disconnect | 56.21 | 35.53 | 63% | 0.62 | 126,278 |

2.90 af

| Runoff Reduction Volume and Treated volumes | | | | | | |
|---|---|-------|-------------------------|------------------------------------|-------------------|-------------|
| | Runoff Reduction Techiques/Standard SMPs | | Total Contributing Area | Total Contributing Impervious Area | WQv Reduced (RRv) | WQv Treated |
| | | | (acres) | (acres) | cf | cf |
| Area/Volume Reduction | Conservation of Natural Areas | RR-1 | 0.00 | 0.00 | | |
| | Sheetflow to Riparian Buffers/Filter Strips | RR-2 | 0.00 | 0.00 | | |
| | Tree Planting/Tree Pit | RR-3 | 0.00 | 0.00 | | |
| | Disconnection of Rooftop Runoff | RR-4 | | 0.00 | | |
| | Vegetated Swale | RR-5 | 0.00 | 0.00 | 0 | |
| | Rain Garden | RR-6 | 0.00 | 0.00 | 0 | |
| | Stormwater Planter | RR-7 | 0.00 | 0.00 | 0 | |
| | Rain Barrel/Cistern | RR-8 | 0.00 | 0.00 | 0 | |
| | Porous Pavement | RR-9 | 0.00 | 0.00 | 0 | |
| | Green Roof (Intensive & Extensive) | RR-10 | 0.00 | 0.00 | 0 | |
| Standard SMPs w/RRV Capacity | Infiltration Trench | I-1 | 0.00 | 0.00 | 0 | 0 |
| | Infiltration Basin | I-2 | 0.00 | 0.00 | 0 | 0 |
| | Dry Well | I-3 | 0.00 | 0.00 | 0 | 0 |
| | Underground Infiltration System | I-4 | 0.00 | | | |
| | Bioretention & Infiltration Bioretention | F-5 | 20.05 | 15.31 | 21696 | 31944 |
| | Dry swale | O-1 | 0.00 | 0.00 | 0 | 0 |
| Standard SMPs | Micropool Extended Detention (P-1) | P-1 | | | | |
| | Wet Pond (P-2) | P-2 | 30.16 | 22.09 | | 4500.000 |
| | Wet Extended Detention (P-3) | P-3 | | | | |
| | Multiple Pond system (P-4) | P-4 | | | | |
| | Pocket Pond (p-5) | P-5 | | | | |
| | Surface Sand filter (F-1) | F-1 | | | | |
| | Underground Sand filter (F-2) | F-2 | | | | |
| | Perimeter Sand Filter (F-3) | F-3 | | | | |
| | Organic Filter (F-4) | F-4 | | | | |
| | Shallow Wetland (W-1) | W-1 | | | | |
| | Extended Detention Wetland (W-2) | W-2 | | | | |
| | Pond/Wetland System (W-3) | W-3 | | | | |
| | Pocket Wetland (W-4) | W-4 | | | | |
| | Wet Swale (O-2) | O-2 | | | | |
| Totals by Area Reduction | | → | 0.00 | 0.00 | 0 | |
| Totals by Volume Reduction | | → | 0.00 | 0.00 | 0 | |
| Totals by Standard SMP w/RRV | | → | 20.05 | 15.31 | 21696 | 31944 |
| Totals by Standard SMP | | → | 30.16 | 22.09 | | 4500 |

| | | | | | |
|--------------------------------------|--------------------|-------|-------|--------|--------|
| Totals (Area + Volume + all SMPs) → | | 50.21 | 37.39 | 21,696 | 36,444 |
| | Impervious Cover v | error | | | |
| | Total Area v | error | | | |

Bioretention Worksheet

(For use on HSG C or D Soils with underdrains)

$$Af = WQv * (df) / [k * (hf + df)(tf)]$$

- | | | |
|------------|---|---|
| <i>Af</i> | Required Surface Area (ft ²) | The hydraulic conductivity [ft/day], can be varied depending on the properties of the soil media. Some reported conductivity values are: Sand - 3.5 ft/day (City of Austin 1988); Peat - 2.0 ft/day (Galli 1990); |
| <i>WQv</i> | Water Quality Volume (ft ³) | |
| <i>df</i> | Depth of the Soil Medium (feet) | <i>k</i> |
| <i>hf</i> | Average height of water above the planter bed | Leaf Compost - 8.7 ft/day (Claytor and Schueler, 1996); Bioretention Soil (0.5 ft/day (Claytor & Schueler, 1996)) |
| <i>tf</i> | Volume Through the Filter Media (days) | |

| Design Point: | 1 | | | | | | |
|---|--------------------|-------------------------|---------------------------------------|---|------------------------|---|-------------------|
| Enter Site Data For Drainage Area to be Treated by Practice | | | | | | | |
| Catchment Number | Total Area (Acres) | Impervious Area (Acres) | Percent Impervious % | Rv | WQv (ft ³) | Precipitation (in) | Description |
| 1 | 5.40 | 4.52 | 0.84 | 0.80 | 15744.04 | 1.00 | DA: 1A-III to B-1 |
| Enter Impervious Area Reduced by Disconnection of Rooftops | | | 84% | 0.80 | 15,744 | <<WQv after adjusting for Disconnected Rooftops | |
| Enter the portion of the WQv that is not reduced for all practices routed to this practice. | | | | | | ft ³ | |
| Soil Information | | | | | | | |
| Soil Group | | | | | | | |
| Soil Infiltration Rate | | | in/hour | | | | |
| Using Underdrains? | | Yes | Okay | | | | |
| Calculate the Minimum Filter Area | | | | | | | |
| | | | | Value | Units | Notes | |
| WQv | | | | 15,744 | ft ³ | | |
| Enter Depth of Soil Media | | | <i>df</i> | 2.5 | ft | 2.5-4 ft | |
| Enter Hydraulic Conductivity | | | <i>k</i> | 0.5 | ft/day | | |
| Enter Average Height of Ponding | | | <i>hf</i> | 0.5 | ft | 6 inches max. | |
| Enter Filter Time | | | <i>tf</i> | 2 | days | | |
| Required Filter Area | | | Af | 13120 | ft² | | |
| Determine Actual Bio-Retention Area | | | | | | | |
| Filter Width | | 1 | ft | | | | |
| Filter Length | | 13200 | ft | | | | |
| Filter Area | | 13200 | ft ² | | | | |
| Actual Volume Provided | | 15840 | ft ³ | | | | |
| Determine Runoff Reduction | | | | | | | |
| Is the Bioretention contributing flow to another practice? | | | No | Select Practice | | | |
| RRv | | 6,336 | | | | | |
| RRv applied | | 6,336 | ft ³ | <i>This is 40% of the storage provided or WQv whichever is less.</i> | | | |
| Volume Treated | | 9,408 | ft ³ | <i>This is the portion of the WQv that is not reduced in the practice.</i> | | | |
| Volume Directed | | 0 | ft ³ | This volume is directed another practice | | | |

Bioretention Worksheet

| | | |
|----------|----|--|
| Sizing v | OK | <i>Check to be sure Area provided \geq Af</i> |
|----------|----|--|

(For use on HSG C or D Soils with underdrains)

$$A_f = WQv * (df) / [k * (hf + df)(tf)]$$

| | | |
|----------------------|---|--|
| <i>A_f</i> | Required Surface Area (ft ²) | The hydraulic conductivity [ft/day], can be varied depending on the properties of the soil media. Some reported conductivity values are: Sand - 3.5 ft/day (City of Austin 1988); Peat - 2.0 ft/day (Galli 1990); Leaf Compost - 8.7 ft/day (Claytor and Schueler, 1996); Bioretention Soil (0.5 ft/day (Claytor & Schueler, 1996) |
| <i>WQv</i> | Water Quality Volume (ft ³) | |
| <i>df</i> | Depth of the Soil Medium (feet) | <i>k</i> |
| <i>hf</i> | Average height of water above the planter bed | |
| <i>tf</i> | Volume Through the Filter Media (days) | |

| Design Point: | 1 | | | | | | |
|---|--------------------|-------------------------|---------------------------------------|---|------------------------|---|------------------|
| Enter Site Data For Drainage Area to be Treated by Practice | | | | | | | |
| Catchment Number | Total Area (Acres) | Impervious Area (Acres) | Percent Impervious % | Rv | WQv (ft ³) | Precipitation (in) | Description |
| 2 | 6.75 | 4.67 | 0.69 | 0.67 | 16475.48 | 1.00 | DA: 1A-IV to B-2 |
| Enter Impervious Area Reduced by Disconnection of Rooftops | | | 69% | 0.67 | 16,475 | <<WQv after adjusting for Disconnected Rooftops | |
| Enter the portion of the WQv that is not reduced for all practices routed to this practice. | | | | | | ft ³ | |
| Soil Information | | | | | | | |
| Soil Group | | D | | | | | |
| Soil Infiltration Rate | | | in/hour | | | | |
| Using Underdrains? | | Yes | Okay | | | | |
| Calculate the Minimum Filter Area | | | | | | | |
| | | | | Value | Units | Notes | |
| WQv | | | | 16,475 | ft ³ | | |
| Enter Depth of Soil Media | | | <i>df</i> | 2.5 | ft | 2.5-4 ft | |
| Enter Hydraulic Conductivity | | | <i>k</i> | 0.5 | ft/day | | |
| Enter Average Height of Ponding | | | <i>hf</i> | 0.5 | ft | 6 inches max. | |
| Enter Filter Time | | | <i>tf</i> | 2 | days | | |
| Required Filter Area | | | A_f | 13730 | ft² | | |
| Determine Actual Bio-Retention Area | | | | | | | |
| Filter Width | | 1 | ft | | | | |
| Filter Length | | 14000 | ft | | | | |
| Filter Area | | 14000 | ft ² | | | | |
| Actual Volume Provided | | 16800 | ft ³ | | | | |
| Determine Runoff Reduction | | | | | | | |
| Is the Bioretention contributing flow to another practice? | | | No | Select Practice | | | |
| RRv | | 6,720 | | | | | |
| RRv applied | | 6,720 | ft³ | <i>This is 40% of the storage provided or WQv whichever is less.</i> | | | |
| Volume Treated | | 9,755 | ft ³ | <i>This is the portion of the WQv that is not reduced in the practice.</i> | | | |

Bioretention Worksheet

| | | | |
|-----------------|----|-----------------|--|
| Volume Directed | 0 | ft ³ | This volume is directed another practice |
| Sizing V | OK | | Check to be sure Area provided ≥ Af |

(For use on HSG C or D Soils with underdrains)

$$Af = WQv * (df) / [k * (hf + df)(tf)]$$

| | | |
|------------|---|--|
| <i>Af</i> | Required Surface Area (ft ²) | The hydraulic conductivity [ft/day], can be varied depending on the properties of the soil media. Some reported conductivity values are: Sand - 3.5 ft/day (City of Austin 1988); Peat - 2.0 ft/day (Galli 1990); Leaf Compost - 8.7 ft/day (Claytor and Schueler, 1996); Bioretention Soil (0.5 ft/day (Claytor & Schueler 1996)) |
| <i>WQv</i> | Water Quality Volume (ft ³) | |
| <i>df</i> | Depth of the Soil Medium (feet) | <i>k</i> |
| <i>hf</i> | Average height of water above the planter bed | |
| <i>tf</i> | Volume Through the Filter Media (days) | |

| Design Point: | 1 | | | | | | | |
|---|--------------------|-------------------------|---------------------------------------|--|------------------------|---|-----------------|--|
| Enter Site Data For Drainage Area to be Treated by Practice | | | | | | | | |
| Catchment Number | Total Area (Acres) | Impervious Area (Acres) | Percent Impervious % | Rv | WQv (ft ³) | Precipitation (in) | Description | |
| 3 | 5.32 | 4.09 | 0.77 | 0.74 | 14321.26 | 1.00 | DA: 1A-V to B-3 | |
| Enter Impervious Area Reduced by Disconnection of Rooftops | | | 77% | 0.74 | 14,321 | <<WQv after adjusting for Disconnected Rooftops | | |
| Enter the portion of the WQv that is not reduced for all practices routed to this practice. | | | | | | ft ³ | | |
| Soil Information | | | | | | | | |
| Soil Group | D | | | | | | | |
| Soil Infiltration Rate | | | in/hour | | | | | |
| Using Underdrains? | Yes | | Okay | | | | | |
| Calculate the Minimum Filter Area | | | | | | | | |
| | | | | Value | Units | Notes | | |
| WQv | | | | 14,321 | ft ³ | | | |
| Enter Depth of Soil Media | | | <i>df</i> | 2.5 | ft | 2.5-4 ft | | |
| Enter Hydraulic Conductivity | | | <i>k</i> | 0.5 | ft/day | | | |
| Enter Average Height of Ponding | | | <i>hf</i> | 0.5 | ft | 6 inches max. | | |
| Enter Filter Time | | | <i>tf</i> | 2 | days | | | |
| Required Filter Area | | | Af | 11934 | ft² | | | |
| Determine Actual Bio-Retention Area | | | | | | | | |
| Filter Width | 1 | ft | | | | | | |
| Filter Length | 12000 | ft | | | | | | |
| Filter Area | 12000 | ft ² | | | | | | |
| Actual Volume Provided | 14400 | ft ³ | | | | | | |
| Determine Runoff Reduction | | | | | | | | |
| Is the Bioretention contributing flow to another practice? | | | | Select Practice | | | | |
| RRv | 5,760 | | | | | | | |
| RRv applied | 5,760 | ft³ | | This is 40% of the storage provided or WQv whichever is less. | | | | |

Bioretention Worksheet

| | | | |
|-----------------|-------|-----------------|---|
| Volume Treated | 8,561 | ft ³ | This is the portion of the WQv that is not reduced in the practice. |
| Volume Directed | 0 | ft ³ | This volume is directed another practice |
| Sizing v | OK | | Check to be sure Area provided ≥ Af |

(For use on HSG C or D Soils with underdrains)

$$Af = WQv * (df) / [k * (hf + df)(tf)]$$

| | | | |
|------------|---|----------|---|
| <i>Af</i> | Required Surface Area (ft ²) | | The hydraulic conductivity [ft/day], can be varied depending on the properties of the soil media. Some reported conductivity values are: Sand - 3.5 ft/day (City of Austin 1988); Peat - 2.0 ft/day (Galli 1990); |
| <i>WQv</i> | Water Quality Volume (ft ³) | | |
| <i>df</i> | Depth of the Soil Medium (feet) | <i>k</i> | (City of Austin 1988); Peat - 2.0 ft/day (Galli 1990); |
| <i>hf</i> | Average height of water above the planter bed | | Leaf Compost - 8.7 ft/day (Claytor and Schueler, 1996); Bioretention Soil (0.5 ft/day (Claytor & Schueler, 1996)) |
| <i>tf</i> | Volume Through the Filter Media (days) | | |

| Design Point: | 1 | | | | | | |
|---|--------------------|-------------------------|---------------------------------------|-----------------|------------------------|---|------------------|
| Enter Site Data For Drainage Area to be Treated by Practice | | | | | | | |
| Catchment Number | Total Area (Acres) | Impervious Area (Acres) | Percent Impervious % | Rv | WQv (ft ³) | Precipitation (in) | Description |
| 4 | 2.57 | 2.03 | 0.79 | 0.76 | 7098.83 | 1.00 | DA: 1A-VI to B-4 |
| Enter Impervious Area Reduced by Disconnection of Rooftops | | | 79% | 0.76 | 7,099 | <<WQv after adjusting for Disconnected Rooftops | |
| Enter the portion of the WQv that is not reduced for all practices routed to this practice. | | | | | | ft ³ | |
| Soil Information | | | | | | | |
| Soil Group | | D | | | | | |
| Soil Infiltration Rate | | | in/hour | | | | |
| Using Underdrains? | | Yes | Okay | | | | |
| Calculate the Minimum Filter Area | | | | | | | |
| | | | | Value | Units | Notes | |
| WQv | | | | 7,099 | ft ³ | | |
| Enter Depth of Soil Media | | | <i>df</i> | 2.5 | ft | 2.5-4 ft | |
| Enter Hydraulic Conductivity | | | <i>k</i> | 0.5 | ft/day | | |
| Enter Average Height of Ponding | | | <i>hf</i> | 0.5 | ft | 6 inches max. | |
| Enter Filter Time | | | <i>tf</i> | 2 | days | | |
| Required Filter Area | | | Af | 5916 | ft² | | |
| Determine Actual Bio-Retention Area | | | | | | | |
| Filter Width | | 1 | ft | | | | |
| Filter Length | | 6000 | ft | | | | |
| Filter Area | | 6000 | ft ² | | | | |
| Actual Volume Provided | | 7200 | ft ³ | | | | |
| Determine Runoff Reduction | | | | | | | |
| Is the Bioretention contributing flow to another practice? | | | No | Select Practice | | | |
| RRv | | 2,880 | | | | | |

Bioretention Worksheet

| | | | |
|--------------------|--------------|-----------------------|---|
| RRv applied | 2,880 | ft³ | <i>This is 40% of the storage provided or WQv whichever is less.</i> |
| Volume Treated | 4,219 | ft ³ | <i>This is the portion of the WQv that is not reduced in the practice.</i> |
| Volume Directed | 0 | ft ³ | <i>This volume is directed another practice</i> |
| Sizing v | OK | | <i>Check to be sure Area provided ≥ Af</i> |

| | |
|--|-----------|
| Total RRv Applied | 21,696.00 |
| Total Area | 20.05 |
| Total Impervious Area | 15.31 |
| Total Volume Treated | 31,943.60 |
| Rooftop Disconnect Impervious Area Total | 0.00 |

Provided Water Quality Volume (WQv) Calculations

Design Point #1

I. Breakdown of Subcatchments

| Drainage Area | Total Area (Ac) | Imperv. Area (Ac) | Percent Imperv. | Rv | WQv* (cf) | Practice Description | Practice Name |
|---------------|-----------------|-------------------|-----------------|-------|-----------|----------------------|---------------|
| D.A. #1A-III | 5.40 | 4.52 | 84% | 0.803 | 15744 | Bioretention | B-1 |
| D.A. #1A-IV | 6.75 | 4.67 | 69% | 0.672 | 16475 | Bioretention | B-2 |
| D.A. #1A-V | 5.32 | 4.09 | 77% | 0.741 | 14321 | Bioretention | B-3 |
| D.A. #1A-VI | 2.57 | 2.03 | 79% | 0.760 | 7099 | Bioretention | B-4 |
| D.A. #1A-II | 10.12 | 6.78 | 67% | 0.653 | 23996 | Wet Pond | P-1 |
| | | | | | | | |

77636

Total Imperv:

22.09

*Based on P = 1.00 in

II. Provided WQv

| D.A. | Practice | Total Area (Ac) | Imperv. Area (Ac) | WQv Provided (cf) | WQv Provided (Ac-ft) |
|--------------|----------|-----------------|-------------------|-------------------|----------------------|
| D.A. #1A-III | B-1 | 5.40 | 4.52 | 15744 | 0.361 |
| D.A. #1A-IV | B-2 | 6.75 | 4.67 | 16475 | 0.378 |
| D.A. #1A-V | B-3 | 5.32 | 4.09 | 14321 | 0.329 |
| D.A. #1A-VI | B-4 | 2.57 | 2.03 | 7099 | 0.163 |
| D.A. #1A-II | P-1 | 10.12 | 6.78 | 4500 | 0.103 |
| | | 0.00 | 0.00 | 0 | 0.000 |
| Total | | 30.161 | 22.088 | 58140 | 1.335 |

Exist. Standard Practice WQv to remain/be replaced = 0.0 cf

Required Water Quality Volume (WQv) Calculations

Discharge Point #2

I. Project Delineation

Project Delineation - By Drainage Area (D.A.)

| Classification | Drainage Area (Ac) | Impervious Area in D.A. (Ac) | % Imp. | Rv | Exist. WQv Provd'd (Ac-ft) |
|--|--------------------|------------------------------|--------|------|----------------------------|
| New Development | 5.000 | 1.367 | 27% | 0.30 | - |
| Redevelopment <i>(Without existing WQv provided)</i> | 78.814 | 73.468 | 93% | 0.89 | - |
| Redevelopment <i>(With Existing WQv provided in a standard practice)</i> | N/A | N/A | - | - | N/A |
| Total | 83.814 | 74.835 | - | - | - |

Project Delineation - By Limits of Disturbance (LOD)

| Classification | LOD Area (Ac) | Impervious Area in LOD (Ac) | % Imp. | Rv | Exist. WQv Provd'd (Ac-ft) |
|--|---------------|-----------------------------|--------|-------|----------------------------|
| New Development | 5.000 | 1.367 | 27.34% | 0.296 | - |
| Redevelopment <i>(Without existing WQv provided)</i> | 79.767 | 73.710 | 92.41% | 0.882 | - |
| Redevelopment <i>(With Existing WQv provided in an alternative practice)</i> | 0.000 | 0.000 | - | - | N/A |
| Total | 84.767 | 75.077 | - | - | - |

II. New Development Areas - Required WQv

| | |
|--|-----------|
| Project located in an Enhanced Phosphorus Removal Area? | NO |
|--|-----------|

From Chapter 4: New York State Stormwater Management Design Manual:

Table 4.1 New York State Sizing Criteria

90% Rule:

$$\text{WQv (initial)} = \frac{(P)(Rv)(A)}{12}$$

Where:

| | | |
|-----------------------------|------|-------|
| $Rv = 0.05 + 0.009 * I(\%)$ | Rv = | 0.296 |
| A = New Develop't D.A. (Ac) | A = | 5.00 |
| P = 90% Rainfall (in) | P = | 1.00 |

| | | |
|--|--------------|-----------|
| Required WQv for New Development: | 5,373 | cf |
|--|--------------|-----------|

III. WQv/RRv Provided By Area Reduction Practices & Rooftop Disconnect

WQv/RRv Prvd'd By Area Reduc. Prac. & Rftop Disconnt: 0 cf

IV. WQv/RRv Provided By Volume Reduction Practices

Volume Reduction Practices Not Use to Provide WQv/RRv

WQv/RRv Prvd'd By Volume Reduc. Prac.: - cf

V. WQv Provided By Standard Practices

| Practice | Drainage Area (Ac) | Imp. Area (Ac) | RRv Prvd'd (cf) | WQv Prvd'd (Non RRv) (cf) | Total WQv Prvd'd (cf) |
|---------------------------------|--------------------|----------------|-----------------|---------------------------|-----------------------|
| Infiltration Trench | - | - | - | - | - |
| Infiltration Basin | - | - | - | - | - |
| Dry Well | - | - | - | - | - |
| Underground Infiltration | - | - | - | - | - |
| Bioretention & Infiltration Bio | 2.98 | 2.58 | 3600 | 5370 | 8970 |
| Dry Swale | - | - | - | - | - |
| Micropool Extended Det. (P-1) | - | - | - | - | - |
| Wet Pond (P-2) | - | - | - | - | - |
| Wet Extended Det. (P-3) | - | - | - | - | - |
| Multiple Pond System (P-4) | - | - | - | - | - |
| Pocket Pond (P-5) | - | - | - | - | - |
| Surface Sand Filter (F-3) | - | - | - | - | - |
| Perimeter Sand Filter (F-3) | - | - | - | - | - |
| Organic Filter (F-4) | - | - | - | - | - |
| Shallow Wetland (W-1) | - | - | - | - | - |
| Extended Det. Wetland (W-2) | - | - | - | - | - |
| Pond/Wetland System (W-3) | - | - | - | - | - |
| Pocket Wetland (W-4) | - | - | - | - | - |
| Wet Swale (O-2) | - | - | - | - | - |
| Total | 2.98 | 2.58 | 3600 | 5370 | 8970 |

WQv Provided By Standard Practices: 8,970 cf

VI. Total WQv Required/Provided By Standard Practices

New Developmnt WQv Reqr'd To Be Provided in a Standard Practice: 5,373 cf (Part II.)

| Standard Practice | WQv Provd'd (cf) | |
|--------------------------------|------------------|-------------|
| Area Reduction & Roof Disconn. | 0.00 | (Part III.) |
| Volume Reduction | - | (Part IV.) |
| Standard Practices | 8970 | (Part V.) |
| Total | 8970 | |

Provd'd WQv in Stndrd Prac. Meets/Exceeds Required? YES

Excess WQv Provided: 3,596 cf

(This Volume May Be Applied To Meeting Redevelopment WQv Requirements Where Applicable)

VII. Redevelopment Areas - Required Water Quality Volume

Based on Chapter 9 Redevelopment Standards

Project located in an Enhanced Phosphorus Removal Area? NO

Table 4.1 New York State Sizing Criteria

| | | |
|--|-------------------------------------|--------------|
| 90% Rule: | Where: | |
| $\text{WQv (initial)} = \frac{(P)(Rv)(A)}{12}$ | $Rv = 0.05 + 0.009 \cdot I(\%)$ | $Rv = 0.882$ |
| | $A = \text{Redevelopment LOD (Ac)}$ | $A = 79.77$ |
| | $P = 90\% \text{ Rainfall (in)}$ | $P = 1.00$ |

Initial Required WQv for Redevelopment: 255,288 cf

Water Quality Volume Provided Through Impervious Cover Reduction

| | | |
|--|-------|----|
| Existing Impervious Cover in LOD/Redevelopment Area: | 79.75 | Ac |
| Removed Impervious Cover: | -3.57 | Ac |
| Existing Impervious Cover in LOD/Redev. Remaining: | 76.18 | Ac |

Percentage of Exist. Impervious Cvr Removed: 4.5%

Impervious Cover Reduction Is Less Than 25% and Therefore Does Not Completely Meet Redevelopment WQv requirements. Use Additional Practices.

WQv Provided Through Standard Practices Which May Be Applied to Redevelopment

Excess WQv Provided in Standard Practice: 3596 cf (Part VI.)

Stndrd Prac. WQv as % of Initial WQv for Redevelop.: 1.4%

Total Standard Practice WQv & Impervious Cover Reduction

| | | |
|------|--|-------------|
| 4.5% | Percentage of Exist. Impervious Cvr Removed: | %ICR |
| 1.4% | Stndrd Prac. WQv as % of Initial WQv for Redevelop.: | %RRv & %WQv |
| 5.9% | Total %RRv & %ICR & %WQv | |

Impervious Cover Reduction and WQv Provided in Standard Practices Is Less Than 25% and Therefore Does Not Completely Meet Redevelopment WQv Requirements. Use Additional Practices.

Total WQv Required To Be Provided in an Alternative Practice

5.9% :WQv Provd'd through Imp. Cover Reduction & Stndrd Prac.'s (%RRv & %ICR & %WQv)

$$\text{WQv (Alternative Prac.)} = \text{WQv Initial/Redevelopment} \times \left(\frac{25 - \%RRv - \%ICR - \%WQv}{100} \times 3 \right)$$

$$\begin{array}{r} 25 \\ -5.9 \quad \%RRv/\%ICR/\%WQv \\ \hline 19.1 \\ \times \quad 3 \\ \hline 57.4\% \end{array}$$

57.4% of Initial WQv/Redevelopment To Be Provided in an Alternative Practice

146,422 cf of WQv Required To Be Provided in an Alternative Practice

VIII. Total Water Quality Volume Provided by Alternative Practices

Project located in an Enhanced Phosphorus Removal Area? NO

| DA | Drainage Area (Ac) | Impervious Area (Ac) | % Imperv. | Rv | Available WQv (cf) | Pk 10yr Flow (cfs) | Unit Designation |
|----------|--------------------|----------------------|-----------|-----------|--------------------|--------------------|------------------|
| D.A. #2B | 11.87 | 11.87 | 100% | 0.95 | 40941 | 51.38 | - |
| D.A. #2D | 17.42 | 17.30 | 99% | 0.94 | 59680 | | |
| | 14.00 | 13.5 | 96% | 0.9178571 | 46646 | - | - |
| | Total | | | | 147267 | | |

Total WQv Provided with Alternative Practices: 147267 cf

Required WQv To Be Provided in an Alternative Practice: 146422 cf

Meets Requirements for Redevelopment WQv? YES

IX. Total WQv Required Summary

| Project Classification | WQv Method | Req'r'd WQv (cf) | Req'r'd WQv (cf) | Req'r'd WQv (Ac-ft) |
|------------------------|-------------|------------------|------------------|---------------------|
| New Development | Standard | 5,373 | 5,373 | 0.123 |
| Redevelopment | Imp. Remvl | 11,419 | 161,436 | 3.706 |
| | Standard | 3,596 | | |
| | Alternative | 146,422 | | |
| Total | - | 166,810 | 166,810 | 3.829 |

X. Total WQv Provided Summary

| Project Classification | WQv Method | Provd'd WQv (cf) | Provd'd WQv (cf) | Provd'd WQv (Ac-ft) |
|-------------------------------|-------------------|-------------------------|-------------------------|----------------------------|
| New Development | Standard | 5,373 | 5,373 | 0.123 |
| Redevelopment | Imp. Remvl | 11,419 | 162,281 | 3.725 |
| | Standard | 3,596 | | |
| | Alternative | 147,267 | | |
| Total | - | 167,655 | 167,655 | 3.849 |

| | |
|---|------------|
| Provided WQv Meets/Exceeds Required WQv? | YES |
|---|------------|

Minimum Required & Provided RRv Calculations
Discharge Point #2

Enter the Soils Data for the site

| Soil Group | Acres | S |
|-------------------|--------------|-----|
| A | 0.00 | 55% |
| B | 0.00 | 40% |
| C | 11.96 | 30% |
| D | 71.86 | 20% |
| Total Area | 83.81 | |

New Development Area

Total Area = New Development Area

Calculate the Minimum RRv

| | | |
|--------------------|--------------|------------------------------|
| S = | 0.214 | |
| Impervious = | 1.367 | <i>acre</i> |
| Precipitation | 1.00 | <i>in</i> |
| Rv | 0.95 | |
| Minimum RRv | 1010 | <i>ft³</i> |
| | 0.023 | <i>af</i> |

| Drainage Area | Practice | Practice Name | Total Area | Imp. Area | RRv Provided (cf) | RRv Provided (Ac-ft) |
|---------------|--------------|---------------|------------|-----------|-------------------|----------------------|
| D.A. #2A-II | Bioretention | B-6 | 2.98 | 2.58 | 3600 | 0.083 |
| | | | | | - | - |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Total | - | - | 2.98 | 2.58 | 3600 | 0.083 |

RRv Provided Exceeds Minimum RRv? Yes

Is this project subject to Chapter 10 of the NYS Design Manual (i.e. WQv is equal to post-development 1 year runoff volume)?..... **No**

| | | | |
|---------------|------|------|---|
| Design Point: | 2 | | <i>Manually enter P, Total Area and Impervious Cover.</i> |
| P= | 1.00 | inch | |

Breakdown of Subcatchments

| Catchment Number | Total Area (Acres) | Impervious Area (Acres) | Percent Impervious % | Rv | WQv (ft ³) | Description |
|------------------|--------------------|-------------------------|----------------------|------|------------------------|--------------------|
| 1 | 40.03 | 35.39 | 88% | 0.85 | 122,884 | DA 2A-I |
| 2 | 2.98 | 2.58 | 87% | 0.83 | 8,970 | DA 2A-II |
| 3 | 11.52 | 7.69 | 67% | 0.65 | 27,223 | DA 2C |
| 4 | 11.87 | 11.88 | 100% | 0.95 | 40,950 | DA 2B |
| 5 | 17.42 | 17.30 | 99% | 0.94 | 59,690 | DA 2D |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |
| Subtotal (1-30) | 83.81 | 74.84 | 89% | 0.85 | 259,718 | Subtotal 1 |
| Total | 83.81 | 74.84 | 89% | 0.85 | 259,718 | Initial WQv |

5.96 af

Identify Runoff Reduction Techniques By Area

| Technique | Total Contributing Area | Contributing Impervious Area | Notes |
|-------------------------------|-------------------------|------------------------------|--|
| | (Acre) | (Acre) | |
| Conservation of Natural Areas | 0.00 | 0.00 | minimum 10,000 sf |
| Riparian Buffers | 0.00 | 0.00 | maximum contributing length 75 feet to 150 feet |
| Filter Strips | 0.00 | 0.00 | |
| Tree Planting | 0.00 | 0.00 | Up to 100 sf directly connected impervious area may be subtracted per tree |
| Total | 0.00 | 0.00 | |

Recalculate WQv after application of Area Reduction Techniques

| | Total Area (Acres) | Impervious Area (Acres) | Percent Impervious % | Runoff Coefficient Rv | WQv (ft ³) |
|--|--------------------|-------------------------|----------------------|-----------------------|------------------------|
| "<<Initial WQv" | 83.81 | 74.84 | 89% | 0.85 | 259,718 |
| Subtract Area | 0.00 | 0.00 | | | |
| WQv adjusted after Area Reductions | 83.81 | 74.84 | 89% | 0.85 | 259,718 |
| Disconnection of Rooftops | | 0.00 | | | |
| Adjusted WQv after Area Reduction and Rooftop Disconnect | 83.81 | 74.84 | 89% | 0.85 | 259,718 |

5.96 af

| Runoff Reduction Volume and Treated volumes | | | | | | |
|---|---|-------|-------------------------|------------------------------------|-------------------|-------------|
| | Runoff Reduction Techiques/Standard SMPs | | Total Contributing Area | Total Contributing Impervious Area | WQv Reduced (RRv) | WQv Treated |
| | | | (acres) | (acres) | cf | cf |
| Area/Volume Reduction | Conservation of Natural Areas | RR-1 | 0.00 | 0.00 | | |
| | Sheetflow to Riparian Buffers/Filter Strips | RR-2 | 0.00 | 0.00 | | |
| | Tree Planting/Tree Pit | RR-3 | 0.00 | 0.00 | | |
| | Disconnection of Rooftop Runoff | RR-4 | | 0.00 | | |
| | Vegetated Swale | RR-5 | 0.00 | 0.00 | 0 | |
| | Rain Garden | RR-6 | 0.00 | 0.00 | 0 | |
| | Stormwater Planter | RR-7 | 0.00 | 0.00 | 0 | |
| | Rain Barrel/Cistern | RR-8 | 0.00 | 0.00 | 0 | |
| | Porous Pavement | RR-9 | 0.00 | 0.00 | 0 | |
| | Green Roof (Intensive & Extensive) | RR-10 | 0.00 | 0.00 | 0 | |
| Standard SMPs w/RRV Capacity | Infiltration Trench | I-1 | 0.00 | 0.00 | 0 | 0 |
| | Infiltration Basin | I-2 | 0.00 | 0.00 | 0 | 0 |
| | Dry Well | I-3 | 0.00 | 0.00 | 0 | 0 |
| | Underground Infiltration System | I-4 | 0.00 | | | |
| | Bioretention & Infiltration Bioretention | F-5 | 2.98 | 2.58 | 3600 | 5370 |
| | Dry swale | O-1 | 0.00 | 0.00 | 0 | 0 |
| Standard SMPs | Micropool Extended Detention (P-1) | P-1 | | | | |
| | Wet Pond (P-2) | P-2 | | | | |
| | Wet Extended Detention (P-3) | P-3 | | | | |
| | Multiple Pond system (P-4) | P-4 | | | | |
| | Pocket Pond (p-5) | P-5 | | | | |
| | Surface Sand filter (F-1) | F-1 | | | | |
| | Underground Sand filter (F-2) | F-2 | | | | |
| | Perimeter Sand Filter (F-3) | F-3 | | | | |
| | Organic Filter (F-4) | F-4 | | | | |
| | Shallow Wetland (W-1) | W-1 | | | | |
| | Extended Detention Wetland (W-2) | W-2 | | | | |
| | Pond/Wetland System (W-3) | W-3 | | | | |
| | Pocket Wetland (W-4) | W-4 | | | | |
| | Wet Swale (O-2) | O-2 | | | | |
| Totals by Area Reduction | | → | 0.00 | 0.00 | 0 | |
| Totals by Volume Reduction | | → | 0.00 | 0.00 | 0 | |
| Totals by Standard SMP w/RRV | | → | 2.98 | 2.58 | 3600 | 5370 |
| Totals by Standard SMP | | → | 0.00 | 0.00 | | 0 |

| | | | | | |
|--------------------------------------|--------------------|-------|------|-------|-------|
| Totals (Area + Volume + all SMPs) → | | 2.98 | 2.58 | 3,600 | 5,370 |
| | Impervious Cover v | error | | | |
| | Total Area v | error | | | |

Bioretention Worksheet

(For use on HSG C or D Soils with underdrains)

$$Af = WQv * (df) / [k * (hf + df)(tf)]$$

| | | | |
|------------|---|----------|---|
| <i>Af</i> | Required Surface Area (ft ²) | | The hydraulic conductivity [ft/day], can be varied depending on the properties of the soil media. Some reported conductivity values are: Sand - 3.5 ft/day (City of Austin 1988); Peat - 2.0 ft/day (Galli 1990); Leaf Compost - 8.7 ft/day (Claytor and Schueler, 1996); Bioretention Soil (0.5 ft/day (Claytor & Schueler, 1996)) |
| <i>WQv</i> | Water Quality Volume (ft ³) | | |
| <i>df</i> | Depth of the Soil Medium (feet) | <i>k</i> | |
| <i>hf</i> | Average height of water above the planter bed | | |
| <i>tf</i> | Volume Through the Filter Media (days) | | |

| Design Point: | 2 | | | | | | |
|---|--------------------|-------------------------|--|-----------------|------------------------|---|-------------|
| Enter Site Data For Drainage Area to be Treated by Practice | | | | | | | |
| Catchment Number | Total Area (Acres) | Impervious Area (Acres) | Percent Impervious % | Rv | WQv (ft ³) | Precipitation (in) | Description |
| 2 | 2.98 | 2.58 | 0.87 | 0.83 | 8969.73 | 1.00 | DA 2A-II |
| Enter Impervious Area Reduced by Disconnection of Rooftops | | | 87% | 0.83 | 8,970 | <<WQv after adjusting for Disconnected Rooftops | |
| Enter the portion of the WQv that is not reduced for all practices routed to this practice. | | | | | | ft ³ | |
| Soil Information | | | | | | | |
| Soil Group | | | | | | | |
| Soil Infiltration Rate | | in/hour | | | | | |
| Using Underdrains? | Yes | Okay | | | | | |
| Calculate the Minimum Filter Area | | | | | | | |
| | | | | Value | Units | Notes | |
| WQv | | | | 8,970 | ft ³ | | |
| Enter Depth of Soil Media | | | <i>df</i> | 2.5 | ft | 2.5-4 ft | |
| Enter Hydraulic Conductivity | | | <i>k</i> | 0.5 | ft/day | | |
| Enter Average Height of Ponding | | | <i>hf</i> | 0.5 | ft | 6 inches max. | |
| Enter Filter Time | | | <i>tf</i> | 2 | days | | |
| Required Filter Area | | | | Af | 7475 | ft² | |
| Determine Actual Bio-Retention Area | | | | | | | |
| Filter Width | 1 | ft | | | | | |
| Filter Length | 7500 | ft | | | | | |
| Filter Area | 7500 | ft ² | | | | | |
| Actual Volume Provided | 9000 | ft ³ | | | | | |
| Determine Runoff Reduction | | | | | | | |
| Is the Bioretention contributing flow to another practice? | | | No | Select Practice | | | |
| RRv | 3,600 | | | | | | |
| RRv applied | 3,600 | ft³ | This is 40% of the storage provided or WQv whichever is less. | | | | |
| Volume Treated | 5,370 | ft ³ | This is the portion of the WQv that is not reduced in the practice. | | | | |
| Volume Directed | 0 | ft ³ | This volume is directed another practice | | | | |

Required Water Quality Volume (WQv) Calculations

Discharge Point #3

I. Project Delineation

Project Delineation - By Drainage Area (D.A.)

| Classification | Drainage Area (Ac) | Impervious Area in D.A. (Ac) | % Imp. | Rv | Exist. WQv Provd'd (Ac-ft) |
|--|--------------------|------------------------------|--------|------|----------------------------|
| New Development | 13.000 | 12.751 | 98% | 0.93 | - |
| Redevelopment <i>(Without existing WQv provided)</i> | 0.000 | 0.000 | - | - | - |
| Redevelopment <i>(With Existing WQv provided in a standard practice)</i> | 42.981 | 12.94 | 30% | 0.32 | 1.467 |
| Total | 55.981 | 25.687 | - | - | 1.467 |

Project Delineation - By Limits of Disturbance (LOD)

| Classification | LOD Area (Ac) | Impervious Area in LOD (Ac) | % Imp. | Rv | Exist. WQv Provd'd (Ac-ft) |
|--|---------------|-----------------------------|--------|-------|----------------------------|
| New Development | 13.000 | 12.751 | 98.08% | 0.933 | - |
| Redevelopment <i>(Without existing WQv provided)</i> | 0.000 | 0.000 | - | - | - |
| Redevelopment <i>(With Existing WQv provided in an alternative practice)</i> | 30.660 | 9.591 | 31% | 0.332 | 1.467 |
| Total | 43.660 | 22.342 | - | - | 1.467 |

II. Existing WQv Provided

| | | | | | |
|-----------------------------------|--------|-------|---|--|----------|
| Existing Drainage Area to Pond: | 51.300 | Ac | | | |
| Existing Impervious Area to Pond: | 16.711 | Ac | | | |
| % Impervious Area: | 32.58% | | | | |
| Rv [0.05+0.009*%I]: | 0.34 | | | | |
| P = 90% Rainfall (in) | 1.00 | in | | | |
| Existing WQv Provided: | 1.467 | Ac-ft | = | | 63906 cf |

II. New Development Areas - Required WQv

| | |
|---|----|
| Project located in an Enhanced Phosphorus Removal Area? | NO |
|---|----|

From Chapter 4: New York State Stormwater Management Design Manual:

Table 4.1 New York State Sizing Criteria

90% Rule:

$$\text{WQv (initial)} = \frac{(P)(Rv)(A)}{12}$$

Where:

| | | |
|--------------------------|------|-------|
| $Rv=0.05+0.009*I(\%)$ | Rv = | 0.933 |
| A=New Develop't D.A.(Ac) | A = | 13.00 |
| P = 90% Rainfall (in) | P = | 1.00 |

Required WQv for New Development: 44,017 cf

III. WQv/RRv Provided By Area Reduction Practices & Rooftop Disconnect

Area Reduction Practices and Rooftop Disconnect Not Used To Provide WQv/RRv

WQv/RRv Prvd'd By Area Reduc. Prac. & Rftop Disconnt: 0 cf

IV. WQv/RRv Provided By Volume Reduction Practices

Volume Reduction Practices Not Use to Provide WQv/RRv

WQv/RRv Prov'd By Volume Reduc. Prac.: - cf

V. WQv Provided By Standard Practices

| Practice | Drainage Area (Ac) | Imp. Area (Ac) | RRv Prvd'd (cf) | WQv Prvd'd (Non RRv) (cf) | Total WQv Prvd'd (cf) |
|---------------------------------|--------------------|----------------|-----------------|---------------------------|-----------------------|
| Infiltration Trench | - | - | - | - | - |
| Infiltration Basin | - | - | - | - | - |
| Dry Well | - | - | - | - | - |
| Underground Infiltration | - | - | - | - | - |
| Bioretention & Infiltration Bio | 14.94 | 11.59 | 3360 | 5018 | 8378 |
| Dry Swale | - | - | - | - | - |
| Micropool Extended Det. (P-1) | - | - | - | - | - |
| Wet Pond (P-2) | 17.24 | 11.98 | 0 | 21796 | 21796 |
| Wet Extended Det. (P-3) | - | - | - | - | - |
| Multiple Pond System (P-4) | - | - | - | - | - |
| Pocket Pond (P-5) | - | - | - | - | - |
| Surface Sand Filter (F-3) | - | - | - | - | - |
| Perimeter Sand Filter (F-3) | - | - | - | - | - |
| Organic Filter (F-4) | - | - | - | - | - |
| Shallow Wetland (W-1) | - | - | - | - | - |

| | | | | | |
|-----------------------------|-------|-------|------|-------|-------|
| Extended Det. Wetland (W-2) | - | - | - | - | - |
| Pond/Wetland System (W-3) | - | - | - | - | - |
| Pocket Wetland (W-4) | - | - | - | - | - |
| Wet Swale (O-2) | - | - | - | - | - |
| Total | 32.18 | 23.57 | 3360 | 26814 | 30174 |

WQv Provided By Standard Practices: 30,174 cf

VI. Total WQv Required/Provided By Standard Practices

New Developmnt WQv Reqr'd To Be Provided in a Standard Practice: 44,017 cf (Part II.)

| Standard Practice | WQv Provd'd (cf) | |
|--------------------------------|------------------|-------------|
| Existing Standard Practice | 63906 | (Part I.) |
| Area Reduction & Roof Disconn. | 0.00 | (Part III.) |
| Volume Reduction | - | (Part IV.) |
| New Standard Practices | 30174 | (Part V.) |
| Total | 94080 | |

Provd'd WQv in Stndrd Prac. Meets/Exceeds Required? YES

Excess WQv Provided: 50,063 cf

(This Volume May Be Applied To Meeting Redevelopment WQv Requirements Where Applicable)

VII. Redevelopment Areas - Required Water Quality Volume

Based on Chapter 9 Redevelopment Standards

Project located in an Enhanced Phosphorus Removal Area? NO

Table 4.1 New York State Sizing Criteria

90% Rule:

$$\text{WQv (initial)} = \frac{(P)(R_v)(A)}{12}$$

Where:

| | | |
|------------------------------------|---------|-------|
| $R_v = 0.05 + 0.009 * I(\%)$ | $R_v =$ | 0.321 |
| $A = \text{Redevelopment DA (Ac)}$ | $A =$ | 42.98 |
| $P = 90\% \text{ Rainfall (in)}$ | $P =$ | 1.00 |

Required WQv for Redevelopment: 50,063 cf

WQv Provided Through Standard Practices Which May Be Applied to Redevelopment

Excess WQv Provided in Standard Practice: 50063 cf (Part VI.)

Required WQv is met through existing pond and new pond and bioretention facility standard practices. No Further Practices Needed

VIII. Total Water Quality Volume Provided by Alternative Practices

Total WQv Provided with Alternative Practices: 0 cf

IX. Total WQv Required Summary

| Project Classification | WQv Method | Reqr'd WQv (cf) | Reqr'd WQv (cf) | Reqr'd WQv (Ac-ft) |
|------------------------|-------------|-----------------|-----------------|--------------------|
| New Development | Standard | 44,017 | 44,017 | 1.010 |
| Redevelopment | Imp. Remvl | 0 | 50,063 | 1.149 |
| | Standard | 50,063 | | |
| | Alternative | 0 | | |
| Total | - | 94,080 | 94,080 | 2.160 |

X. Total WQv Provided Summary

| Project Classification | WQv Method | Provd'd WQv (cf) | Provd'd WQv (cf) | Provd'd WQv (Ac-ft) |
|------------------------|-------------|------------------|------------------|---------------------|
| New Development | Standard | 44,017 | 44,017 | 1.010 |
| Redevelopment | Imp. Remvl | 0 | 50,063 | 1.149 |
| | Standard | 50,063 | | |
| | Alternative | 0 | | |
| Total | - | 94,080 | 94,080 | 2.160 |

Provided WQv Meets/Exceeds Required WQv? YES

Minimum Required & Provided RRv Calculations
Discharge Point #3

Enter the Soils Data for the site

| Soil Group | Acres | S |
|-------------------|--------------|-----|
| A | 0.00 | 55% |
| B | 0.00 | 40% |
| C | 0.00 | 30% |
| D | 55.98 | 20% |
| Total Area | 55.98 | |

New Development Area

Total Area = New Development Area

Calculate the Minimum RRv

| | | |
|--------------------|--------------|-------------------|
| S = | 0.200 | |
| Impervious = | 12.751 | <i>acre</i> |
| Precipitation | 1.00 | <i>in</i> |
| Rv | 0.95 | |
| Minimum RRv | 8794 | <i>ft3</i> |
| | 0.202 | <i>af</i> |

| Drainage Area | Practice | Practice Name | Total Area | Imp. Area | RRv Provided (cf) | RRv Provided (Ac-ft) |
|---------------|--------------|---------------|------------|-----------|-------------------|----------------------|
| D.A. #3A-II | Bioretention | B-5 | 14.94 | 11.59 | 3360 | 0.077 |
| | | | | | - | - |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Total | - | - | 14.94 | 11.59 | 3360 | 0.077 |

RRv Provided Exceeds Minimum RRv? No

Is this project subject to Chapter 10 of the NYS Design Manual (i.e. WQv is equal to post-development 1 year runoff volume)?..... **No**

| | | | |
|---------------|------|------|---|
| Design Point: | 2 | | <i>Manually enter P, Total Area and Impervious Cover.</i> |
| P= | 1.00 | inch | |

Breakdown of Subcatchments

| Catchment Number | Total Area (Acres) | Impervious Area (Acres) | Percent Impervious % | Rv | WQv (ft ³) | Description |
|------------------|--------------------|-------------------------|----------------------|------|------------------------|--------------------|
| 1 | 14.94 | 11.59 | 78% | 0.75 | 40,586 | DA: 3A-II to B-5 |
| 2 | 2.30 | 0.38 | 17% | 0.20 | 1,672 | DA: 3A-III to P-2 |
| 3 | 31.33 | 12.22 | 39% | 0.40 | 45,620 | DA-3A-I |
| 4 | 7.41 | 1.49 | 20% | 0.23 | 6,202 | DA: 3B |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |
| Subtotal (1-30) | 55.98 | 25.69 | 46% | 0.46 | 94,080 | Subtotal 1 |
| Total | 55.98 | 25.69 | 46% | 0.46 | 94,080 | Initial WQv |

2.16 af

Identify Runoff Reduction Techniques By Area

| Technique | Total Contributing Area | Contributing Impervious Area | Notes |
|-------------------------------|-------------------------|------------------------------|---|
| | (Acre) | (Acre) | |
| Conservation of Natural Areas | 0.00 | 0.00 | <i>minimum 10,000 sf</i> |
| Riparian Buffers | 0.00 | 0.00 | <i>maximum contributing length 75 feet to 150 feet</i> |
| Filter Strips | 0.00 | 0.00 | |
| Tree Planting | 0.00 | 0.00 | <i>Up to 100 sf directly connected impervious area may be subtracted per tree</i> |
| Total | 0.00 | 0.00 | |

Recalculate WQv after application of Area Reduction Techniques

| | Total Area (Acres) | Impervious Area (Acres) | Percent Impervious % | Runoff Coefficient Rv | WQv (ft ³) |
|--|--------------------|-------------------------|----------------------|-----------------------|------------------------|
| "<<Initial WQv" | 55.98 | 25.69 | 46% | 0.46 | 94,080 |
| Subtract Area | 0.00 | 0.00 | | | |
| WQv adjusted after Area Reductions | 55.98 | 25.69 | 46% | 0.46 | 94,080 |
| Disconnection of Rooftops | | 0.00 | | | |
| Adjusted WQv after Area Reduction and Rooftop Disconnect | 55.98 | 25.69 | 46% | 0.46 | 94,080 |

2.16 af

| Runoff Reduction Volume and Treated volumes | | | | | | |
|---|---|-------|-------------------------|------------------------------------|-------------------|-------------|
| | Runoff Reduction Techiques/Standard SMPs | | Total Contributing Area | Total Contributing Impervious Area | WQv Reduced (RRv) | WQv Treated |
| | | | (acres) | (acres) | cf | cf |
| Area/Volume Reduction | Conservation of Natural Areas | RR-1 | 0.00 | 0.00 | | |
| | Sheetflow to Riparian Buffers/Filter Strips | RR-2 | 0.00 | 0.00 | | |
| | Tree Planting/Tree Pit | RR-3 | 0.00 | 0.00 | | |
| | Disconnection of Rooftop Runoff | RR-4 | | 0.00 | | |
| | Vegetated Swale | RR-5 | 0.00 | 0.00 | 0 | |
| | Rain Garden | RR-6 | 0.00 | 0.00 | 0 | |
| | Stormwater Planter | RR-7 | 0.00 | 0.00 | 0 | |
| | Rain Barrel/Cistern | RR-8 | 0.00 | 0.00 | 0 | |
| | Porous Pavement | RR-9 | 0.00 | 0.00 | 0 | |
| | Green Roof (Intensive & Extensive) | RR-10 | 0.00 | 0.00 | 0 | |
| Standard SMPs w/RRV Capacity | Infiltration Trench | I-1 | 0.00 | 0.00 | 0 | 0 |
| | Infiltration Basin | I-2 | 0.00 | 0.00 | 0 | 0 |
| | Dry Well | I-3 | 0.00 | 0.00 | 0 | 0 |
| | Underground Infiltration System | I-4 | 0.00 | | | |
| | Bioretention & Infiltration Bioretention | F-5 | 14.94 | 11.59 | 15629 | 24957 |
| | Dry swale | O-1 | 0.00 | 0.00 | 0 | 0 |
| Standard SMPs | Micropool Extended Detention (P-1) | P-1 | | | | |
| | Wet Pond (P-2) | P-2 | 17.24 | 11.98 | | 21796.000 |
| | Wet Extended Detention (P-3) | P-3 | | | | |
| | Multiple Pond system (P-4) | P-4 | | | | |
| | Pocket Pond (p-5) | P-5 | | | | |
| | Surface Sand filter (F-1) | F-1 | | | | |
| | Underground Sand filter (F-2) | F-2 | | | | |
| | Perimeter Sand Filter (F-3) | F-3 | | | | |
| | Organic Filter (F-4) | F-4 | | | | |
| | Shallow Wetland (W-1) | W-1 | | | | |
| | Extended Detention Wetland (W-2) | W-2 | | | | |
| | Pond/Wetland System (W-3) | W-3 | | | | |
| | Pocket Wetland (W-4) | W-4 | | | | |
| | Wet Swale (O-2) | O-2 | | | | |
| Totals by Area Reduction | | → | 0.00 | 0.00 | 0 | |
| Totals by Volume Reduction | | → | 0.00 | 0.00 | 0 | |
| Totals by Standard SMP w/RRV | | → | 14.94 | 11.59 | 15629 | 24957 |
| Totals by Standard SMP | | → | 17.24 | 11.98 | | 21796 |

| | | | | | |
|--------------------------------------|--------------------|-------|-------|--------|--------|
| Totals (Area + Volume + all SMPs) → | | 32.18 | 23.57 | 15,629 | 46,753 |
| | Impervious Cover v | error | | | |
| | Total Area v | error | | | |

Provided Water Quality Volume (WQv) Calculations

Discharge Point #3

I. Breakdown of Subcatchments

| Drainage Area | Total Area (Ac) | Imperv. Area (Ac) | Percent Imperv. | Rv | WQv* (cf) | Practice Description | Practice Name |
|---------------|-----------------|-------------------|-----------------|-------|-----------|----------------------|---------------|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| D.A. #3A-II | 14.94 | 11.59 | 78% | 0.748 | 40586 | Bioretention | B-5 |
| D.A. #3A-III | 2.30 | 0.38 | 17% | 0.200 | 1672 | Wet Pond | P-2 |

 Total: 11.98

 *Based on P = 1.00 in

II. Provided WQv

| D.A. | Practice | Total Area (Ac) | Imperv. Area (Ac) | WQv Provided (cf) | WQv Provided (Ac-ft) |
|--------------|----------|-----------------|-------------------|-------------------|----------------------|
| | | | | | |
| | | | | | |
| | | | | | |
| D.A. #3A-II | B-5 | 14.94 | 11.59 | 8378 | 0.192 |
| D.A. #3A-III | P-2 | 2.30 | 0.38 | 21796 | 0.500 |
| Total | | 17.24 | 11.98 | 30174 | 0.693 |

| | |
|--|----|
| Exist. Standard Practice WQv to remain/be replaced = | cf |
|--|----|

Channel Protection Volume Calculations - Discharge Pt #1

Channel Protection Volume Required for New Development

Method: *Appendix B of the Stormwater Management Design Manual for Storage Volume & TR-55 Graphical Peak Discharge Method*

Data

| | | | |
|---------------------------------------|---------------|----|---------------------|
| New Development Drainage Area (A) = | <u>16.000</u> | Ac | |
| Runoff Curve number (CN) = | <u>98</u> | | (100% imperv.) |
| Time of Concentration (Tc) = | <u>0.10</u> | hr | (assumed max.) |
| Rainfall Distribution Type = | <u>II</u> | | |
| Percentage that is Pond/Swamp areas = | <u>0%</u> | | |
| Storm Frequency Used = | <u>1-Year</u> | | |
| 24-Hr Precipitation Value (P) = | <u>1.84</u> | in | (See Rainfall Data) |
| Initial abstraction (Ia) = | <u>0.041</u> | in | (Table 4-1 of TR55) |

Computed

| | | | |
|--|--------------|--------|---------------------------|
| Ia/P = | <u>0.02</u> | | (min. value = 0.1) |
| Unit Peak Discharge (q_u) = | <u>1000</u> | csm/in | (Exhibit 4-II, TR-55) |
| Ratio of pk discharge outflow/inflow (q_o/q_i)* = | <u>0.02</u> | | (Fig. B-1, App. B) |
| *Based on T=24-hr | | | |
| Ratio of reqr'd. storage volume to runoff volume (V_s/V_r) = | <u>0.458</u> | | (Fig. B-2 App. B NYSSMDM) |
| Potential max. runoff retention (S) = | <u>0.204</u> | | (Eq. 2-4, TR-55) |
| Runoff (Q) = | <u>1.616</u> | in | (Eq. 2-3, TR-55) |
| Required Storage Volume (V_s) = | <u>0.987</u> | Ac-ft | (Eq. 2.1.17, App B) |

Channel Protection Volume Required for Redevelopment

Applicability Determination: Will post-development 1-yr, 24-hr discharge rate and velocity be less than or equal to existing conditions?

Yes, both the post-development rate and velocity will be at, or below,
 Answer: existing conditions

Redevelopment CPv Requirements: Already met through rate & velocity attenuation

Total Required Channel Protection Volume

CPv Required for New Development Areas = 0.987 Ac-ft

CPv Required for Redevelopment Areas = 0.000 Ac-ft

Total Required CPv = 0.987 Ac-ft

Total Provided Channel Protection Volume

| | <u>Practice</u> | <u>Vol. Prvded</u> | | <u>Notes</u> |
|----|-----------------|--------------------|-------|--|
| 1) | Pond (P-1) | 1.000 | Ac-ft | <i>Detention Storage from Elev. 746.5 to</i> |
| 2) | RRv | 0.498 | Ac-ft | <i>748.63 (WSE to 1-Yr Ponding Elev.)</i> |

| | | |
|---------------------|-------|-------|
| Total CPv Provd'd = | 1.498 | Ac-ft |
|---------------------|-------|-------|

Channel Protection Volume Calculations - Discharge Pt #2

Channel Protection Volume Required for New Development

Method: *Appendix B of the Stormwater Management Design Manual for Storage Volume & TR-55 Graphical Peak Discharge Method*

Data

| | | | |
|---------------------------------------|---------------|----|---------------------|
| New Development Drainage Area (A) = | <u>5.000</u> | Ac | |
| Runoff Curve number (CN) = | <u>98</u> | | (100% imperv.) |
| Time of Concentration (Tc) = | <u>0.10</u> | hr | (assumed max.) |
| Rainfall Distribution Type = | <u>II</u> | | |
| Percentage that is Pond/Swamp areas = | <u>0%</u> | | |
| Storm Frequency Used = | <u>1-Year</u> | | |
| 24-Hr Precepitation Value (P) = | <u>1.84</u> | in | (See Rainfall Data) |
| Initial abstration (Ia) = | <u>0.041</u> | in | (Table 4-1 of TR55) |

Computed

| | | | |
|--|--------------|--------|------------------------------|
| Ia/P = | <u>0.02</u> | | (min. value = 0.1) |
| Unit Peak Discharge (q_u) = | <u>1000</u> | csm/in | (Exhibit 4-II, TR-55) |
| Ratio of pk discharge outflow/inflow (q_o/q_i)* = | <u>0.02</u> | | (Fig. B-1, App. B) |
| *Based on T=24-hr | | | |
| Ratio of reqr'd. storage volume to runoff volume (V_s/V_r) = | <u>0.458</u> | | (Fig. B-2 of App. B NYSSMDM) |
| Potential max. runoff retention (S) = | <u>0.204</u> | | (Eq. 2-4, TR-55) |
| Runoff (Q) = | <u>1.616</u> | in | (Eq. 2-3, TR-55) |
| Required Storage Volume (V_s) = | <u>0.308</u> | Ac-ft | (Eq. 2.1.17, App B) |

Channel Protection Volume Required for Redevelopment

Applicability Determination: Will post-development 1-yr, 24-hr discharge rate and velocity be less than or equal to existing conditions?

Yes, both the post-development rate and velocity will be at, or below,
 Answer: existing conditions

Redevelmnt CPv Reqrmnts: Already met through rate & velocity attenuation

Total Required Channel Protection Volume

CPv Required for New Development Areas = 0.308 Ac-ft
 CPv Required for Redevelopment Areas = 0.000 Ac-ft

Total Required CPv = 0.308 Ac-ft

Total Provided Channel Protection Volume

| | <u>Practice</u> | <u>Vol. Prvded</u> | | <u>Notes</u> |
|----|-----------------|--------------------|-------|---|
| 1) | | | Ac-ft | <i>Detention Storage from Elev. 738.05</i> |
| 2) | RRv | 0.083 | Ac-ft | <i>to 740.8 (WSE to 1-Yr Ponding Elev.)</i> |

| | | |
|---------------------|-------|-------|
| Total CPv Provd'd = | 0.083 | Ac-ft |
|---------------------|-------|-------|

Channel Protection Volume Calculations - Discharge Pt #3

Channel Protection Volume Required for New Development

Method: *Appendix B of the Stormwater Management Design Manual for Storage Volume & TR-55 Graphical Peak Discharge Method*

Data

| | | | |
|---------------------------------------|---------------|----|---------------------|
| New Development Drainage Area (A) = | <u>13.000</u> | Ac | |
| Runoff Curve number (CN) = | <u>98</u> | | (100% imperv.) |
| Time of Concentration (Tc) = | <u>0.10</u> | hr | (assumed max.) |
| Rainfall Distribution Type = | <u>II</u> | | |
| Percentage that is Pond/Swamp areas = | <u>0%</u> | | |
| Storm Frequency Used = | <u>1-Year</u> | | |
| 24-Hr Precipitation Value (P) = | <u>1.84</u> | in | (See Rainfall Data) |
| Initial abstraction (Ia) = | <u>0.041</u> | in | (Table 4-1 of TR55) |

Computed

| | | | |
|--|--------------|--------|------------------------------|
| Ia/P = | <u>0.02</u> | | (min. value = 0.1) |
| Unit Peak Discharge (q_u) = | <u>1000</u> | csm/in | (Exhibit 4-II, TR-55) |
| Ratio of pk discharge outflow/inflow (q_o/q_i)* = | <u>0.02</u> | | (Fig. B-1, App. B) |
| *Based on T=24-hr | | | |
| Ratio of reqr'd. storage volume to runoff volume (V_s/V_r) = | <u>0.458</u> | | (Fig. B-2 of App. B NYSSMDM) |
| Potential max. runoff retention (S) = | <u>0.204</u> | | (Eq. 2-4, TR-55) |
| Runoff (Q) = | <u>1.616</u> | in | (Eq. 2-3, TR-55) |
| Required Storage Volume (V_s) = | <u>0.802</u> | Ac-ft | (Eq. 2.1.17, App B) |

Channel Protection Volume Required for Redevelopment

Applicability Determination: Will post-development 1-yr, 24-hr discharge rate and velocity be less than or equal to existing conditions?

Yes, both the post-development rate and velocity will be at, or below,
 Answer: existing conditions

Redevelopment CPv Requirements: Already met through rate & velocity attenuation

Total Required Channel Protection Volume

| | | |
|--|--------------|-------|
| CPv Required for New Development Areas = | <u>0.802</u> | Ac-ft |
| CPv Required for Redevelopment Areas = | <u>0.000</u> | Ac-ft |

Total Required CPv = 0.802 Ac-ft

Total Provided Channel Protection Volume

| | <u>Practice</u> | <u>Vol. Prvded</u> | | <u>Notes</u> |
|----|-----------------|--------------------|-------|--|
| 1) | Pond (P-2) | 1.085 | Ac-ft | <i>Detention Storage from Elev. 736.0 to</i> |
| 2) | RRv | 0.077 | Ac-ft | <i>737.64 (WSE to 1-Yr Ponding Elev.)</i> |

| | | |
|---------------------|-------|-------|
| Total CPv Provd'd = | 1.162 | Ac-ft |
|---------------------|-------|-------|

NOI Questions (Discharge Point #1, #2 & #3 Combined)

| # | NOI Question | Discharge Point #1 | Discharge Point #2 | Discharge Point #3 | Total Reported Value | |
|------------|--|--------------------|--------------------|--------------------|----------------------|-------|
| | | cf | cf | cf | cf | af |
| | <i>Total WQv Required for New Development</i> | 55,169 | 5,373 | 44,017 | 104,560 | 2.400 |
| | <i>Total WQv Required for Redevelopment (Standard/Imp. Reduc.)</i> | 15,936 | 15,015 | 50,063 | 81,013 | 1.860 |
| | <i>Total WQv Required for Redevelopment (Alternative)</i> | 0 | 146,422 | 0 | 146,422 | 3.361 |
| 28 | Total Water Quality Volume (WQv) Required | 71,105 | 166,810 | 94,080 | 331,995 | 7.622 |
| 29 | Total RRv Provided | 21,696 | 3,600 | 3,360 | 28,656 | 0.658 |
| 31 | Is RRv Provided >= WQv Required? | | | | NO | |
| 32 | Minimum RRv | 11,034 | 1,010 | 8,794 | 20,838 | 0.478 |
| 32a | Is RRv Provided >= Minimum RRv Required? | | | | YES | |
| | <i>Total WQv Treated from Green & Standard Practices</i> | 52,379 | 16,788 | 26,814 | 69,168 | 1.588 |
| | <i>Total WQv Treated from Alternative Practices</i> | 0 | 147,267 | 0 | 147,267 | 3.38 |
| | <i>Total WQv Replaced/Maintained from Existing Practices</i> | 0 | 0 | 63906 | 0 | 0.00 |
| 33a | Total WQv Treated | 52,379 | 164,055 | 90,720 | 307,154 | 7.051 |
| 34 | Sum of Volume Reduced & Treated | 74,075 | 167,655 | 94,080 | 335,810 | 7.709 |
| 35 | Is Sum RRv Provided and WQv Provided >= WQv Required? | | | | YES | |

OK

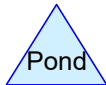
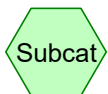
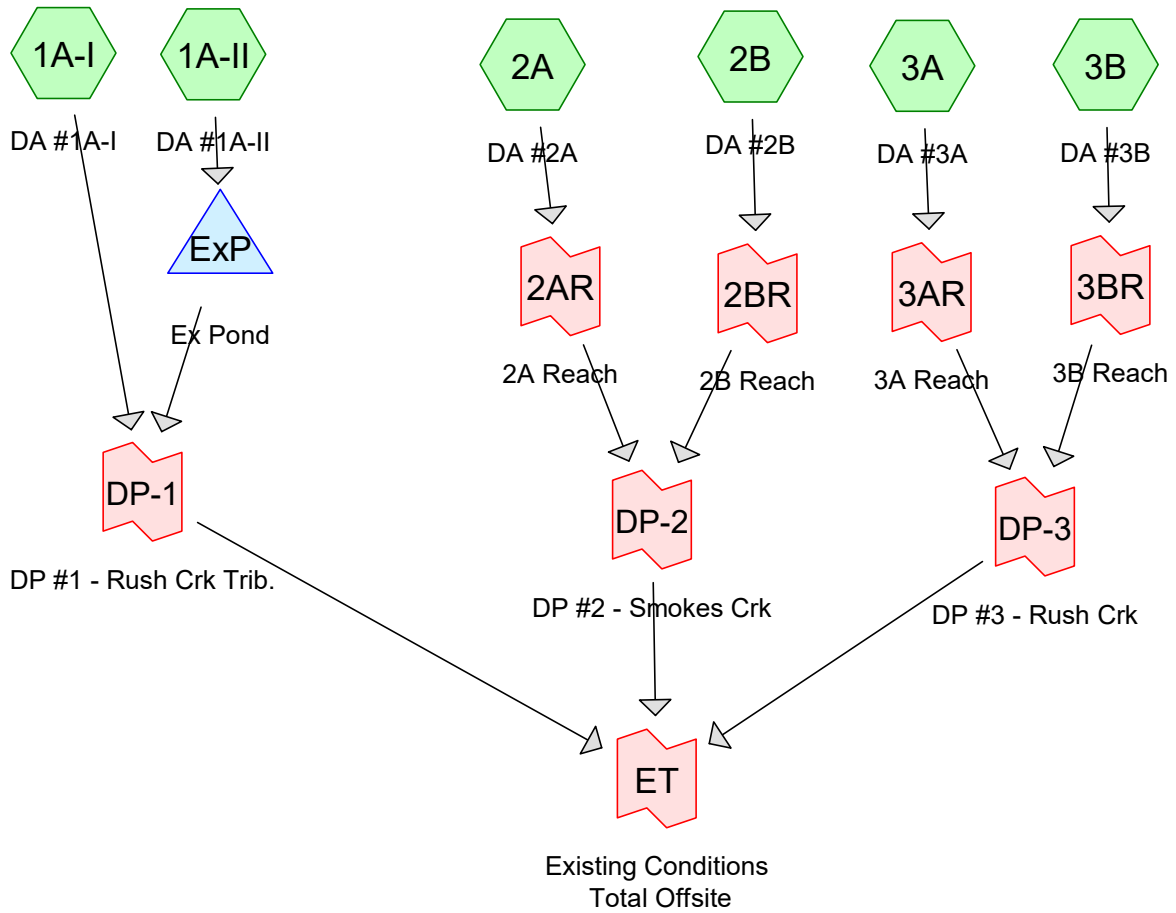
Total

| | | | | | |
|---------------------------------|--------|----------|-------------------|-------|---------------------|
| Existing 1-Yr Peak Rate | 154.04 | Check OK | CPv Reqrd (Ac-ft) | 0.987 | DP-1 |
| <i>Existing 1-Yr Vol</i> | 16.037 | | | 0.308 | DP-2 |
| Proposed 1-Yr Peak Rate | 125.79 | | | 0.802 | DP-3 |
| <i>Proposed 1-Yr Vol</i> | 18.06 | | | 2.097 | Total |
| % Reduction | 18% | | | | |
| <i>Vol Increase</i> | 2.023 | | | | |
| Existing 10-Yr Peak Rate | 319.89 | Check OK | CPv Prvdd (Ac-ft) | 1.498 | DP-1 |
| <i>Existing 10-Yr Vol</i> | 34.765 | | | 0.083 | DP-2 |
| Proposed 10-Yr Peak Rate | 263.17 | | | 1.162 | DP-3 |
| <i>Proposed 10-Yr Vol</i> | 37.715 | | | 2.743 | Total |
| % Reduction | 18% | | | | |
| <i>Vol Increase</i> | 2.950 | | | | |
| Existing 25-Year Peak Rate | 415.86 | Check OK | | | CPv Waived? |
| <i>Existing 25-Year Vol</i> | 45.645 | | | | Waived Because: |
| Proposed 25-Yr Peak Rate | 355.68 | | | | N/A |
| <i>Proposed 25-Yr Peak Rate</i> | 48.92 | | | | |
| % Reduction | 14% | | | | |
| <i>Vol Increase</i> | 3.275 | | | | |
| Existing 100-Yr Peak Rate | 607.6 | Check OK | | | Local Requirements: |
| <i>Existing 100-Yr Vol</i> | 67.36 | | | | |
| Proposed 100-Yr Peak Rate | 541.9 | | | | |
| <i>Proposed 100-Yr Vol</i> | 71.071 | | | | |
| % Reduction | 11% | | | | |
| <i>Vol Increase</i> | 3.711 | | | | |

Local Requirements:

N/A

Existing Conditions



Routing Diagram for Existing Conditions
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Existing Conditions
Type II 24-hr 1-yr Rainfall=1.84"

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Page 2

Summary for Subcatchment 1A-I: DA #1A-I

Runoff = 25.97 cfs @ 12.39 hrs, Volume= 3.181 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.053 | 74 | >75% Grass cover, Good, HSG C |
| 32.764 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 10.684 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 7.171 | 96 | Gravel surface, HSG D |
| 1.631 | 77 | Woods, Good, HSG D |
| 52.303 | 86 | Weighted Average |
| 41.619 | | 79.57% Pervious Area |
| 10.684 | | 20.43% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 30.2 | 150 | 0.0110 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 1.4 | 139 | 0.0110 | 1.69 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 2.2 | 513 | 0.0060 | 3.90 | 102.86 | Trap/Vee/Rect Channel Flow, Bot.W=25.00' D=0.80' Z= 10.0 '/' Top.W=41.00' n= 0.022 Earth, clean & straight |
| 6.7 | 1,798 | | 4.50 | | Direct Entry, Pipe Flow |
| 40.5 | 2,600 | Total | | | |

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Existing Conditions
Type II 24-hr 1-yr Rainfall=1.84"

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Page 3

Summary for Subcatchment 1A-II: DA #1A-II

Runoff = 31.15 cfs @ 11.98 hrs, Volume= 1.564 af, Depth= 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 4.803 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 1.545 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 10.799 | 96 | Gravel surface, HSG D |
| 17.147 | 92 | Weighted Average |
| 15.602 | | 90.99% Pervious Area |
| 1.545 | | 9.01% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 2.7 | 150 | 0.0100 | 0.94 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 0.3 | 25 | 0.0100 | 1.61 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 3.9 | 930 | 0.0100 | 3.93 | 33.44 | Trap/Vee/Rect Channel Flow, Bot.W=15.00' D=0.50' Z= 4.0 '/' Top.W=19.00' n= 0.022 Earth, clean & straight |
| 0.3 | 90 | | 4.50 | | Direct Entry, Pipe Flow |
| 7.2 | 1,195 | Total | | | |

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Existing Conditions
Type II 24-hr 1-yr Rainfall=1.84"

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Page 4

Summary for Subcatchment 2A: DA #2A

Runoff = 101.79 cfs @ 12.14 hrs, Volume= 8.142 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 1.970 | 74 | >75% Grass cover, Good, HSG C |
| 4.741 | 80 | >75% Grass cover, Good, HSG D |
| 15.520 | 98 | Paved parking, HSG C |
| 26.004 | 98 | Paved parking, HSG D |
| 4.966 | 96 | Gravel surface, HSG C |
| 19.613 | 96 | Gravel surface, HSG D |
| 0.595 | 77 | Woods, Good, HSG D |
| 73.409 | 95 | Weighted Average |
| 31.885 | | 43.43% Pervious Area |
| 41.524 | | 56.57% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.9 | 98 | 0.0100 | 0.86 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 13.7 | 65 | 0.0150 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 0.7 | 80 | 0.0150 | 1.97 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 0.8 | 88 | 0.0090 | 1.93 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.8 | 360 | 0.0110 | 2.13 | | Shallow Concentrated Flow, Gravel Paved Kv= 20.3 fps |
| 1.7 | 446 | | 4.50 | | Direct Entry, Pipe Flow |
| 21.6 | 1,137 | Total | | | |

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Existing Conditions
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Subcatchment 2B: DA #2B

Runoff = 2.31 cfs @ 12.21 hrs, Volume= 0.218 af, Depth= 1.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.039 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 0.227 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 1.575 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 1.841 | 96 | Weighted Average |
| 1.614 | | 87.67% Pervious Area |
| 0.227 | | 12.33% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 9.4 | 47 | 0.0200 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 0.9 | 55 | 0.0200 | 1.01 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 9.6 | 48 | 0.0200 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 1.0 | 165 | 0.0270 | 2.65 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 1.3 | 210 | 0.0170 | 2.65 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 3.4 | 465 | 0.0200 | 2.28 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 0.2 | 30 | 0.0200 | 2.87 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.3 | 287 | 0.0170 | 2.10 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 28.1 | 1,307 | Total | | | |

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Existing Conditions
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Subcatchment 3A: DA #3A

Runoff = 14.57 cfs @ 12.38 hrs, Volume= 1.750 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 18.459 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 10.313 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 28.772 | 86 | Weighted Average |
| 18.459 | | 64.16% Pervious Area |
| 10.313 | | 35.84% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 31.4 | 150 | 0.0100 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 3.9 | 380 | 0.0100 | 1.61 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 1.2 | 146 | 0.0100 | 2.03 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.9 | 774 | | 4.50 | | Direct Entry, |
| 39.4 | 1,450 | Total | | | |

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Existing Conditions

Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Subcatchment 3B: DA #3B

Runoff = 10.44 cfs @ 12.33 hrs, Volume= 1.188 af, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 14.241 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 1.496 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 4.902 | 96 | Gravel surface, HSG D |
| 1.889 | 77 | Woods, Good, HSG D |
| 22.528 | 84 | Weighted Average |
| 21.032 | | 93.36% Pervious Area |
| 1.496 | | 6.64% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 26.7 | 150 | 0.0150 | 0.09 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 6.9 | 820 | 0.0150 | 1.97 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 1.5 | 315 | | 3.50 | | Direct Entry, Swale Flow |
| 35.1 | 1,285 | Total | | | |

Existing Conditions

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Existing Conditions
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Pond ExP: Ex Pond

Inflow Area = 17.147 ac, 9.01% Impervious, Inflow Depth = 1.09" for 1-yr event
 Inflow = 31.15 cfs @ 11.98 hrs, Volume= 1.564 af
 Outflow = 10.79 cfs @ 12.12 hrs, Volume= 1.558 af, Atten= 65%, Lag= 8.2 min
 Primary = 10.79 cfs @ 12.12 hrs, Volume= 1.558 af

Routing by Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Peak Elev= 747.30' @ 12.12 hrs Surf.Area= 7,827 sf Storage= 18,166 cf

Plug-Flow detention time= 21.6 min calculated for 1.557 af (100% of inflow)
 Center-of-Mass det. time= 19.3 min (836.7 - 817.4)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|---|
| #1 | 742.60' | 77,688 cf | Exist. Swale (Prismatic) Listed below (Recalc) |
| #2 | 743.80' | 601 cf | 36.0" Round Pipe Storage L= 85.0' S= 0.0260 '/' |
| | | 78,289 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 742.60 | 1 | 0 | 0 |
| 743.00 | 245 | 49 | 49 |
| 744.00 | 2,744 | 1,495 | 1,544 |
| 745.00 | 3,915 | 3,330 | 4,873 |
| 746.00 | 5,216 | 4,566 | 9,439 |
| 747.00 | 6,916 | 6,066 | 15,505 |
| 748.00 | 9,428 | 8,172 | 23,677 |
| 749.00 | 13,835 | 11,632 | 35,308 |
| 750.00 | 20,462 | 17,149 | 52,457 |
| 751.00 | 30,000 | 25,231 | 77,688 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|---------|---|
| #1 | Primary | 742.29' | 30.0" Round Culvert L= 105.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 742.29' / 742.09' S= 0.0019 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf |
| #2 | Device 1 | 743.34' | 15.0" Round Culvert L= 25.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 743.34' / 742.98' S= 0.0144 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf |
| #3 | Device 1 | 750.84' | 24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads |
| #4 | Primary | 750.00' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=10.75 cfs @ 12.12 hrs HW=747.28' (Free Discharge)

- 1=Culvert (Passes 10.75 cfs of 42.32 cfs potential flow)
- 2=Culvert (Inlet Controls 10.75 cfs @ 8.76 fps)
- 3=Grate (Controls 0.00 cfs)
- 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Existing Conditions

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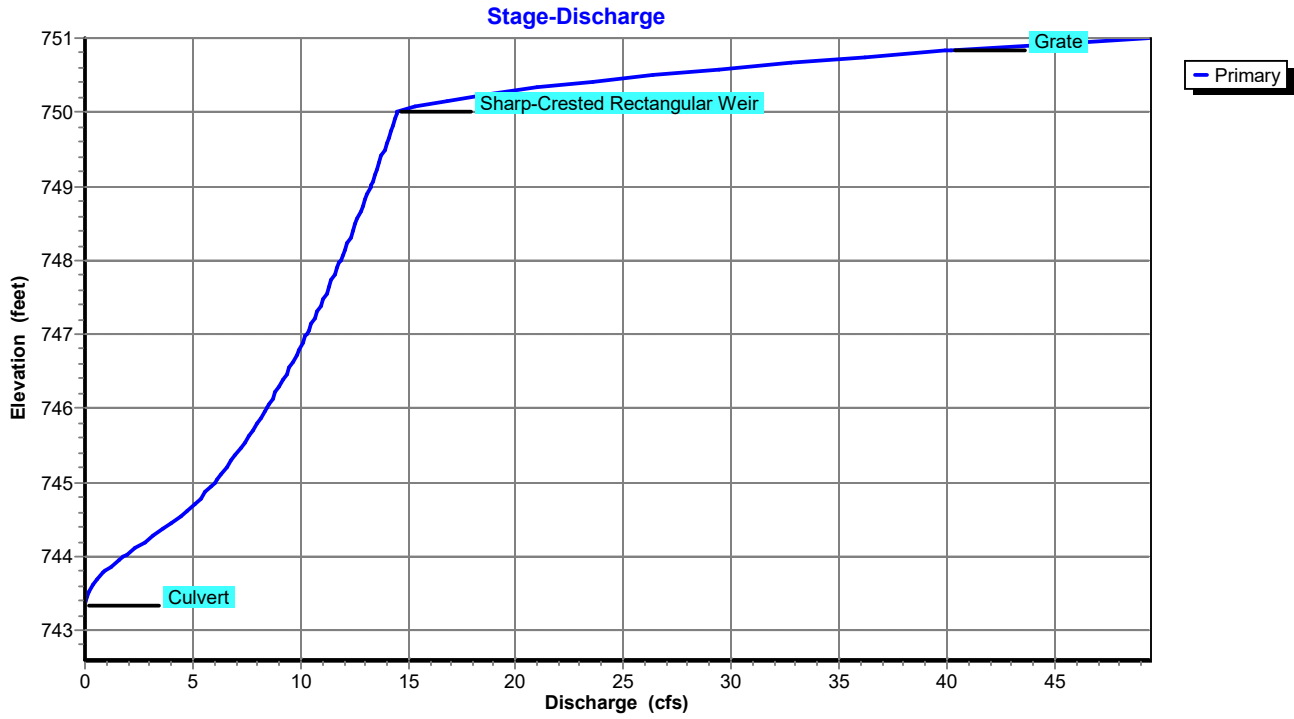
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Existing Conditions
Type II 24-hr 1-yr Rainfall=1.84"

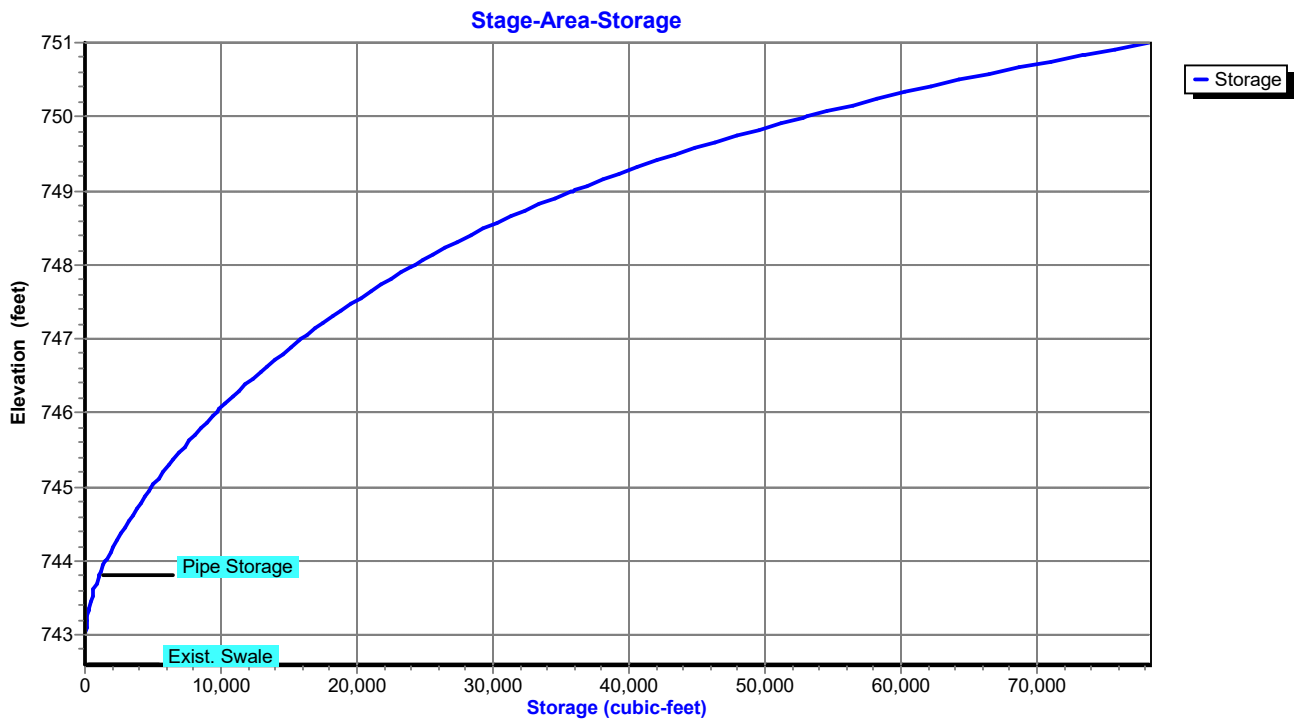
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Pond ExP: Ex Pond



Pond ExP: Ex Pond



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Existing Conditions
Type II 24-hr 1-yr Rainfall=1.84"

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Stage-Discharge for Pond ExP: Ex Pond

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---------------------|------------------|---------------------|------------------|
| 742.60 | 0.00 | 747.70 | 11.42 |
| 742.70 | 0.00 | 747.80 | 11.57 |
| 742.80 | 0.00 | 747.90 | 11.72 |
| 742.90 | 0.00 | 748.00 | 11.87 |
| 743.00 | 0.00 | 748.10 | 12.02 |
| 743.10 | 0.00 | 748.20 | 12.16 |
| 743.20 | 0.00 | 748.30 | 12.30 |
| 743.30 | 0.00 | 748.40 | 12.44 |
| 743.40 | 0.02 | 748.50 | 12.58 |
| 743.50 | 0.12 | 748.60 | 12.72 |
| 743.60 | 0.32 | 748.70 | 12.86 |
| 743.70 | 0.60 | 748.80 | 12.99 |
| 743.80 | 0.95 | 748.90 | 13.13 |
| 743.90 | 1.36 | 749.00 | 13.26 |
| 744.00 | 1.81 | 749.10 | 13.39 |
| 744.10 | 2.27 | 749.20 | 13.52 |
| 744.20 | 2.76 | 749.30 | 13.65 |
| 744.30 | 3.26 | 749.40 | 13.78 |
| 744.40 | 3.77 | 749.50 | 13.90 |
| 744.50 | 4.28 | 749.60 | 14.03 |
| 744.60 | 4.71 | 749.70 | 14.15 |
| 744.70 | 5.07 | 749.80 | 14.27 |
| 744.80 | 5.40 | 749.90 | 14.40 |
| 744.90 | 5.71 | 750.00 | 14.52 |
| 745.00 | 6.01 | 750.10 | 15.67 |
| 745.10 | 6.30 | 750.20 | 17.67 |
| 745.20 | 6.57 | 750.30 | 20.21 |
| 745.30 | 6.83 | 750.40 | 23.20 |
| 745.40 | 7.08 | 750.50 | 26.55 |
| 745.50 | 7.32 | 750.60 | 30.24 |
| 745.60 | 7.56 | 750.70 | 34.22 |
| 745.70 | 7.78 | 750.80 | 38.47 |
| 745.80 | 8.00 | 750.90 | 43.36 |
| 745.90 | 8.22 | 751.00 | 49.39 |
| 746.00 | 8.43 | | |
| 746.10 | 8.63 | | |
| 746.20 | 8.83 | | |
| 746.30 | 9.03 | | |
| 746.40 | 9.22 | | |
| 746.50 | 9.41 | | |
| 746.60 | 9.59 | | |
| 746.70 | 9.77 | | |
| 746.80 | 9.95 | | |
| 746.90 | 10.12 | | |
| 747.00 | 10.29 | | |
| 747.10 | 10.46 | | |
| 747.20 | 10.63 | | |
| 747.30 | 10.79 | | |
| 747.40 | 10.95 | | |
| 747.50 | 11.11 | | |
| 747.60 | 11.27 | | |

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Stage-Area-Storage for Pond ExP: Ex Pond

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---------------------|-------------------------|---------------------|-------------------------|
| 742.60 | 0 | 747.70 | 21,499 |
| 742.70 | 3 | 747.80 | 22,390 |
| 742.80 | 12 | 747.90 | 23,305 |
| 742.90 | 28 | 748.00 | 24,244 |
| 743.00 | 49 | 748.10 | 25,216 |
| 743.10 | 86 | 748.20 | 26,232 |
| 743.20 | 148 | 748.30 | 27,290 |
| 743.30 | 235 | 748.40 | 28,391 |
| 743.40 | 347 | 748.50 | 29,536 |
| 743.50 | 484 | 748.60 | 30,724 |
| 743.60 | 646 | 748.70 | 31,955 |
| 743.70 | 833 | 748.80 | 33,229 |
| 743.80 | 1,045 | 748.90 | 34,547 |
| 743.90 | 1,282 | 749.00 | 35,909 |
| 744.00 | 1,544 | 749.10 | 37,326 |
| 744.10 | 1,826 | 749.20 | 38,809 |
| 744.20 | 2,119 | 749.30 | 40,358 |
| 744.30 | 2,426 | 749.40 | 41,973 |
| 744.40 | 2,744 | 749.50 | 43,655 |
| 744.50 | 3,076 | 749.60 | 45,403 |
| 744.60 | 3,420 | 749.70 | 47,217 |
| 744.70 | 3,777 | 749.80 | 49,098 |
| 744.80 | 4,146 | 749.90 | 51,044 |
| 744.90 | 4,529 | 750.00 | 53,058 |
| 745.00 | 4,924 | 750.10 | 55,151 |
| 745.10 | 5,333 | 750.20 | 57,341 |
| 745.20 | 5,756 | 750.30 | 59,625 |
| 745.30 | 6,193 | 750.40 | 62,005 |
| 745.40 | 6,644 | 750.50 | 64,481 |
| 745.50 | 7,109 | 750.60 | 67,052 |
| 745.60 | 7,589 | 750.70 | 69,718 |
| 745.70 | 8,083 | 750.80 | 72,479 |
| 745.80 | 8,590 | 750.90 | 75,336 |
| 745.90 | 9,112 | 751.00 | 78,289 |
| 746.00 | 9,648 | | |
| 746.10 | 10,200 | | |
| 746.20 | 10,769 | | |
| 746.30 | 11,356 | | |
| 746.40 | 11,960 | | |
| 746.50 | 12,581 | | |
| 746.60 | 13,219 | | |
| 746.70 | 13,874 | | |
| 746.80 | 14,545 | | |
| 746.90 | 15,232 | | |
| 747.00 | 15,935 | | |
| 747.10 | 16,658 | | |
| 747.20 | 17,405 | | |
| 747.30 | 18,176 | | |
| 747.40 | 18,971 | | |
| 747.50 | 19,790 | | |
| 747.60 | 20,633 | | |

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Summary for Link 2AR: 2A Reach

Inflow Area = 73.409 ac, 56.57% Impervious, Inflow Depth = 1.33" for 1-yr event
Inflow = 101.79 cfs @ 12.14 hrs, Volume= 8.142 af
Primary = 100.78 cfs @ 12.25 hrs, Volume= 8.142 af, Atten= 1%, Lag= 6.9 min

Primary outflow = Inflow delayed by 6.9 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link 2BR: 2B Reach

Inflow Area = 1.841 ac, 12.33% Impervious, Inflow Depth = 1.42" for 1-yr event
Inflow = 2.31 cfs @ 12.21 hrs, Volume= 0.218 af
Primary = 2.29 cfs @ 12.35 hrs, Volume= 0.218 af, Atten= 1%, Lag= 8.1 min

Primary outflow = Inflow delayed by 8.0 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Existing Conditions
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link 3AR: 3A Reach

Inflow Area = 28.772 ac, 35.84% Impervious, Inflow Depth = 0.73" for 1-yr event
Inflow = 14.57 cfs @ 12.38 hrs, Volume= 1.750 af
Primary = 14.53 cfs @ 12.44 hrs, Volume= 1.750 af, Atten= 0%, Lag= 3.7 min

Primary outflow = Inflow delayed by 3.7 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link 3BR: 3B Reach

Inflow Area = 22.528 ac, 6.64% Impervious, Inflow Depth = 0.63" for 1-yr event
Inflow = 10.44 cfs @ 12.33 hrs, Volume= 1.188 af
Primary = 10.42 cfs @ 12.47 hrs, Volume= 1.188 af, Atten= 0%, Lag= 8.6 min

Primary outflow = Inflow delayed by 8.6 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link DP-1: DP #1 - Rush Crk Trib.

Inflow Area = 69.450 ac, 17.61% Impervious, Inflow Depth = 0.82" for 1-yr event
Inflow = 35.65 cfs @ 12.37 hrs, Volume= 4.739 af
Primary = 35.65 cfs @ 12.37 hrs, Volume= 4.739 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link DP-2: DP #2 - Smokes Crk

Inflow Area = 75.250 ac, 55.48% Impervious, Inflow Depth = 1.33" for 1-yr event
Inflow = 102.83 cfs @ 12.26 hrs, Volume= 8.360 af
Primary = 102.83 cfs @ 12.26 hrs, Volume= 8.360 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link DP-3: DP #3 - Rush Crk

Inflow Area = 51.300 ac, 23.02% Impervious, Inflow Depth = 0.69" for 1-yr event
Inflow = 24.90 cfs @ 12.46 hrs, Volume= 2.938 af
Primary = 24.90 cfs @ 12.46 hrs, Volume= 2.938 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

Existing Conditions

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Existing Conditions
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link ET: Existing Conditions Total Offsite

Inflow Area = 196.000 ac, 33.57% Impervious, Inflow Depth = 0.98" for 1-yr event
Inflow = 154.04 cfs @ 12.28 hrs, Volume= 16.037 af
Primary = 154.04 cfs @ 12.28 hrs, Volume= 16.037 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

Existing Conditions

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Existing Conditions
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Subcatchment 1A-I: DA #1A-I

Runoff = 66.30 cfs @ 12.37 hrs, Volume= 7.809 af, Depth= 1.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.053 | 74 | >75% Grass cover, Good, HSG C |
| 32.764 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 10.684 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 7.171 | 96 | Gravel surface, HSG D |
| 1.631 | 77 | Woods, Good, HSG D |
| 52.303 | 86 | Weighted Average |
| 41.619 | | 79.57% Pervious Area |
| 10.684 | | 20.43% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 30.2 | 150 | 0.0110 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 1.4 | 139 | 0.0110 | 1.69 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 2.2 | 513 | 0.0060 | 3.90 | 102.86 | Trap/Vee/Rect Channel Flow, Bot.W=25.00' D=0.80' Z= 10.0 '/' Top.W=41.00' n= 0.022 Earth, clean & straight |
| 6.7 | 1,798 | | 4.50 | | Direct Entry, Pipe Flow |
| 40.5 | 2,600 | Total | | | |

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Existing Conditions

Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Subcatchment 1A-II: DA #1A-II

Runoff = 63.18 cfs @ 11.98 hrs, Volume= 3.291 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 4.803 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 1.545 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 10.799 | 96 | Gravel surface, HSG D |
| 17.147 | 92 | Weighted Average |
| 15.602 | | 90.99% Pervious Area |
| 1.545 | | 9.01% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 2.7 | 150 | 0.0100 | 0.94 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 0.3 | 25 | 0.0100 | 1.61 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 3.9 | 930 | 0.0100 | 3.93 | 33.44 | Trap/Vee/Rect Channel Flow, Bot.W=15.00' D=0.50' Z= 4.0 '/' Top.W=19.00' n= 0.022 Earth, clean & straight |
| 0.3 | 90 | | 4.50 | | Direct Entry, Pipe Flow |
| 7.2 | 1,195 | Total | | | |

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Existing Conditions
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Subcatchment 2A: DA #2A

Runoff = 192.53 cfs @ 12.14 hrs, Volume= 15.881 af, Depth= 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 1.970 | 74 | >75% Grass cover, Good, HSG C |
| 4.741 | 80 | >75% Grass cover, Good, HSG D |
| 15.520 | 98 | Paved parking, HSG C |
| 26.004 | 98 | Paved parking, HSG D |
| 4.966 | 96 | Gravel surface, HSG C |
| 19.613 | 96 | Gravel surface, HSG D |
| 0.595 | 77 | Woods, Good, HSG D |
| 73.409 | 95 | Weighted Average |
| 31.885 | | 43.43% Pervious Area |
| 41.524 | | 56.57% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.9 | 98 | 0.0100 | 0.86 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 13.7 | 65 | 0.0150 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 0.7 | 80 | 0.0150 | 1.97 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 0.8 | 88 | 0.0090 | 1.93 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.8 | 360 | 0.0110 | 2.13 | | Shallow Concentrated Flow, Gravel Paved Kv= 20.3 fps |
| 1.7 | 446 | | 4.50 | | Direct Entry, Pipe Flow |
| 21.6 | 1,137 | Total | | | |

Existing Conditions

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Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Subcatchment 2B: DA #2B

Runoff = 4.26 cfs @ 12.21 hrs, Volume= 0.414 af, Depth= 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.039 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 0.227 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 1.575 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 1.841 | 96 | Weighted Average |
| 1.614 | | 87.67% Pervious Area |
| 0.227 | | 12.33% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 9.4 | 47 | 0.0200 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 0.9 | 55 | 0.0200 | 1.01 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 9.6 | 48 | 0.0200 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 1.0 | 165 | 0.0270 | 2.65 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 1.3 | 210 | 0.0170 | 2.65 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 3.4 | 465 | 0.0200 | 2.28 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 0.2 | 30 | 0.0200 | 2.87 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.3 | 287 | 0.0170 | 2.10 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 28.1 | 1,307 | Total | | | |

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Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Subcatchment 3A: DA #3A

Runoff = 37.13 cfs @ 12.36 hrs, Volume= 4.296 af, Depth= 1.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 18.459 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 10.313 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 28.772 | 86 | Weighted Average |
| 18.459 | | 64.16% Pervious Area |
| 10.313 | | 35.84% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 31.4 | 150 | 0.0100 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 3.9 | 380 | 0.0100 | 1.61 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 1.2 | 146 | 0.0100 | 2.03 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.9 | 774 | | 4.50 | | Direct Entry, |
| 39.4 | 1,450 | Total | | | |

Existing Conditions

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Existing Conditions
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Subcatchment 3B: DA #3B

Runoff = 28.71 cfs @ 12.31 hrs, Volume= 3.080 af, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 14.241 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 1.496 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 4.902 | 96 | Gravel surface, HSG D |
| 1.889 | 77 | Woods, Good, HSG D |
| 22.528 | 84 | Weighted Average |
| 21.032 | | 93.36% Pervious Area |
| 1.496 | | 6.64% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 26.7 | 150 | 0.0150 | 0.09 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 6.9 | 820 | 0.0150 | 1.97 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 1.5 | 315 | | 3.50 | | Direct Entry, Swale Flow |
| 35.1 | 1,285 | Total | | | |

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Existing Conditions
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Pond ExP: Ex Pond

Inflow Area = 17.147 ac, 9.01% Impervious, Inflow Depth = 2.30" for 10-yr event
 Inflow = 63.18 cfs @ 11.98 hrs, Volume= 3.291 af
 Outflow = 14.05 cfs @ 12.17 hrs, Volume= 3.285 af, Atten= 78%, Lag= 11.1 min
 Primary = 14.05 cfs @ 12.17 hrs, Volume= 3.285 af

Routing by Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Peak Elev= 749.62' @ 12.17 hrs Surf.Area= 17,936 sf Storage= 45,739 cf

Plug-Flow detention time= 28.9 min calculated for 3.283 af (100% of inflow)
 Center-of-Mass det. time= 27.8 min (824.1 - 796.3)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|---|
| #1 | 742.60' | 77,688 cf | Exist. Swale (Prismatic) Listed below (Recalc) |
| #2 | 743.80' | 601 cf | 36.0" Round Pipe Storage L= 85.0' S= 0.0260 '/' |
| | | 78,289 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 742.60 | 1 | 0 | 0 |
| 743.00 | 245 | 49 | 49 |
| 744.00 | 2,744 | 1,495 | 1,544 |
| 745.00 | 3,915 | 3,330 | 4,873 |
| 746.00 | 5,216 | 4,566 | 9,439 |
| 747.00 | 6,916 | 6,066 | 15,505 |
| 748.00 | 9,428 | 8,172 | 23,677 |
| 749.00 | 13,835 | 11,632 | 35,308 |
| 750.00 | 20,462 | 17,149 | 52,457 |
| 751.00 | 30,000 | 25,231 | 77,688 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|---------|---|
| #1 | Primary | 742.29' | 30.0" Round Culvert L= 105.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 742.29' / 742.09' S= 0.0019 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf |
| #2 | Device 1 | 743.34' | 15.0" Round Culvert L= 25.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 743.34' / 742.98' S= 0.0144 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf |
| #3 | Device 1 | 750.84' | 24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads |
| #4 | Primary | 750.00' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=14.04 cfs @ 12.17 hrs HW=749.61' (Free Discharge)

- 1=Culvert (Passes 14.04 cfs of 57.85 cfs potential flow)
- 2=Culvert (Inlet Controls 14.04 cfs @ 11.44 fps)
- 3=Grate (Controls 0.00 cfs)
- 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Existing Conditions

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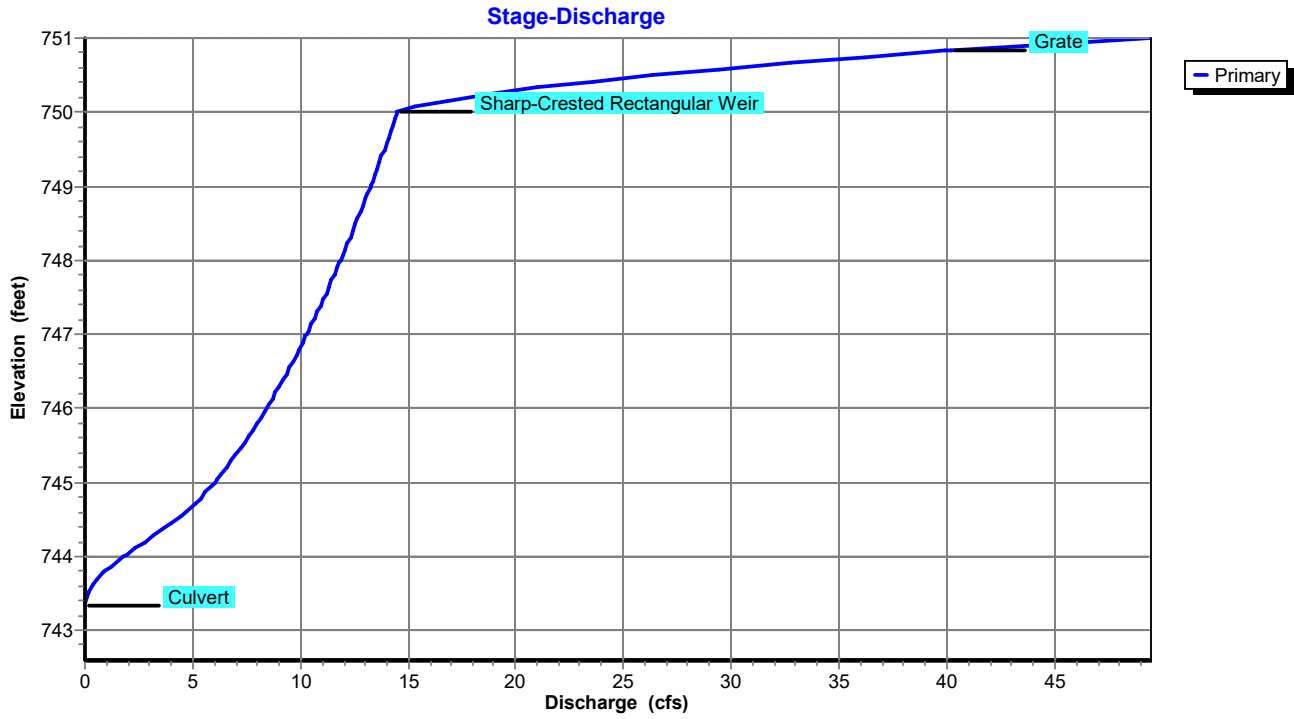
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Existing Conditions
Type II 24-hr 10-yr Rainfall=3.15"

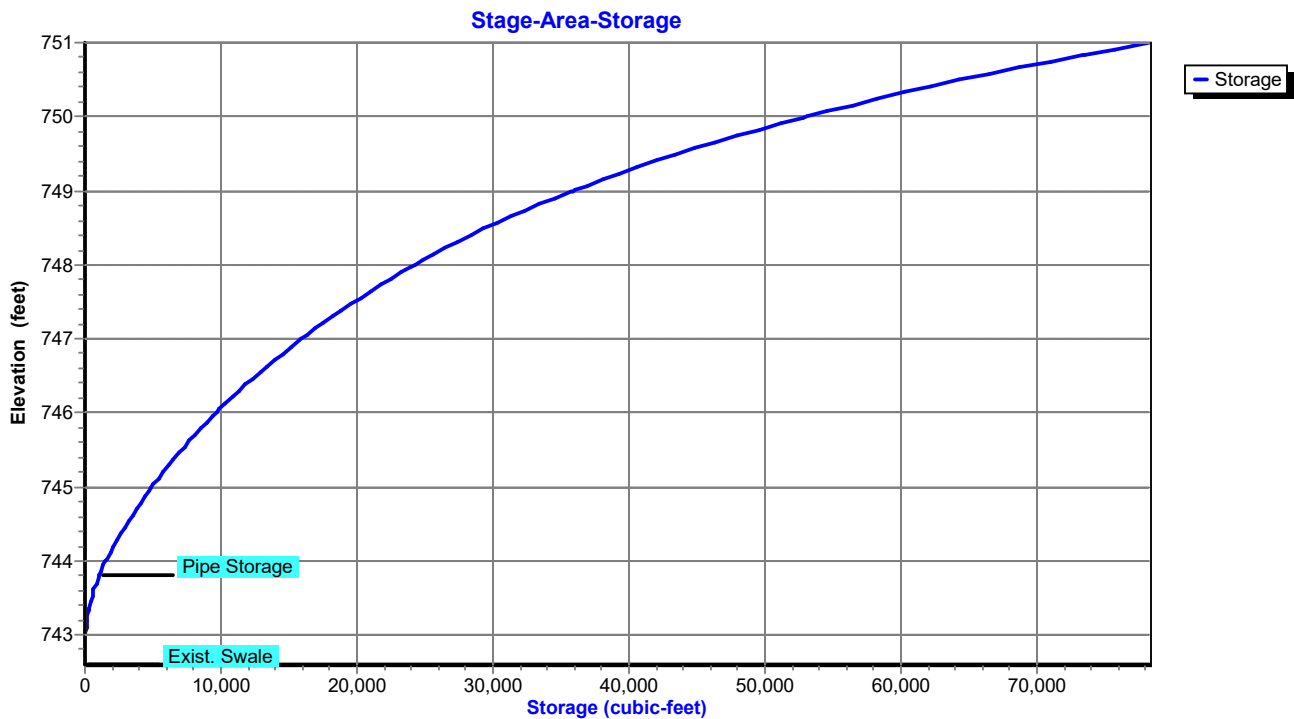
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Pond ExP: Ex Pond



Pond ExP: Ex Pond



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Existing Conditions
Type II 24-hr 10-yr Rainfall=3.15"

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Stage-Discharge for Pond ExP: Ex Pond

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---------------------|------------------|---------------------|------------------|
| 742.60 | 0.00 | 747.70 | 11.42 |
| 742.70 | 0.00 | 747.80 | 11.57 |
| 742.80 | 0.00 | 747.90 | 11.72 |
| 742.90 | 0.00 | 748.00 | 11.87 |
| 743.00 | 0.00 | 748.10 | 12.02 |
| 743.10 | 0.00 | 748.20 | 12.16 |
| 743.20 | 0.00 | 748.30 | 12.30 |
| 743.30 | 0.00 | 748.40 | 12.44 |
| 743.40 | 0.02 | 748.50 | 12.58 |
| 743.50 | 0.12 | 748.60 | 12.72 |
| 743.60 | 0.32 | 748.70 | 12.86 |
| 743.70 | 0.60 | 748.80 | 12.99 |
| 743.80 | 0.95 | 748.90 | 13.13 |
| 743.90 | 1.36 | 749.00 | 13.26 |
| 744.00 | 1.81 | 749.10 | 13.39 |
| 744.10 | 2.27 | 749.20 | 13.52 |
| 744.20 | 2.76 | 749.30 | 13.65 |
| 744.30 | 3.26 | 749.40 | 13.78 |
| 744.40 | 3.77 | 749.50 | 13.90 |
| 744.50 | 4.28 | 749.60 | 14.03 |
| 744.60 | 4.71 | 749.70 | 14.15 |
| 744.70 | 5.07 | 749.80 | 14.27 |
| 744.80 | 5.40 | 749.90 | 14.40 |
| 744.90 | 5.71 | 750.00 | 14.52 |
| 745.00 | 6.01 | 750.10 | 15.67 |
| 745.10 | 6.30 | 750.20 | 17.67 |
| 745.20 | 6.57 | 750.30 | 20.21 |
| 745.30 | 6.83 | 750.40 | 23.20 |
| 745.40 | 7.08 | 750.50 | 26.55 |
| 745.50 | 7.32 | 750.60 | 30.24 |
| 745.60 | 7.56 | 750.70 | 34.22 |
| 745.70 | 7.78 | 750.80 | 38.47 |
| 745.80 | 8.00 | 750.90 | 43.36 |
| 745.90 | 8.22 | 751.00 | 49.39 |
| 746.00 | 8.43 | | |
| 746.10 | 8.63 | | |
| 746.20 | 8.83 | | |
| 746.30 | 9.03 | | |
| 746.40 | 9.22 | | |
| 746.50 | 9.41 | | |
| 746.60 | 9.59 | | |
| 746.70 | 9.77 | | |
| 746.80 | 9.95 | | |
| 746.90 | 10.12 | | |
| 747.00 | 10.29 | | |
| 747.10 | 10.46 | | |
| 747.20 | 10.63 | | |
| 747.30 | 10.79 | | |
| 747.40 | 10.95 | | |
| 747.50 | 11.11 | | |
| 747.60 | 11.27 | | |

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Stage-Area-Storage for Pond ExP: Ex Pond

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---------------------|-------------------------|---------------------|-------------------------|
| 742.60 | 0 | 747.70 | 21,499 |
| 742.70 | 3 | 747.80 | 22,390 |
| 742.80 | 12 | 747.90 | 23,305 |
| 742.90 | 28 | 748.00 | 24,244 |
| 743.00 | 49 | 748.10 | 25,216 |
| 743.10 | 86 | 748.20 | 26,232 |
| 743.20 | 148 | 748.30 | 27,290 |
| 743.30 | 235 | 748.40 | 28,391 |
| 743.40 | 347 | 748.50 | 29,536 |
| 743.50 | 484 | 748.60 | 30,724 |
| 743.60 | 646 | 748.70 | 31,955 |
| 743.70 | 833 | 748.80 | 33,229 |
| 743.80 | 1,045 | 748.90 | 34,547 |
| 743.90 | 1,282 | 749.00 | 35,909 |
| 744.00 | 1,544 | 749.10 | 37,326 |
| 744.10 | 1,826 | 749.20 | 38,809 |
| 744.20 | 2,119 | 749.30 | 40,358 |
| 744.30 | 2,426 | 749.40 | 41,973 |
| 744.40 | 2,744 | 749.50 | 43,655 |
| 744.50 | 3,076 | 749.60 | 45,403 |
| 744.60 | 3,420 | 749.70 | 47,217 |
| 744.70 | 3,777 | 749.80 | 49,098 |
| 744.80 | 4,146 | 749.90 | 51,044 |
| 744.90 | 4,529 | 750.00 | 53,058 |
| 745.00 | 4,924 | 750.10 | 55,151 |
| 745.10 | 5,333 | 750.20 | 57,341 |
| 745.20 | 5,756 | 750.30 | 59,625 |
| 745.30 | 6,193 | 750.40 | 62,005 |
| 745.40 | 6,644 | 750.50 | 64,481 |
| 745.50 | 7,109 | 750.60 | 67,052 |
| 745.60 | 7,589 | 750.70 | 69,718 |
| 745.70 | 8,083 | 750.80 | 72,479 |
| 745.80 | 8,590 | 750.90 | 75,336 |
| 745.90 | 9,112 | 751.00 | 78,289 |
| 746.00 | 9,648 | | |
| 746.10 | 10,200 | | |
| 746.20 | 10,769 | | |
| 746.30 | 11,356 | | |
| 746.40 | 11,960 | | |
| 746.50 | 12,581 | | |
| 746.60 | 13,219 | | |
| 746.70 | 13,874 | | |
| 746.80 | 14,545 | | |
| 746.90 | 15,232 | | |
| 747.00 | 15,935 | | |
| 747.10 | 16,658 | | |
| 747.20 | 17,405 | | |
| 747.30 | 18,176 | | |
| 747.40 | 18,971 | | |
| 747.50 | 19,790 | | |
| 747.60 | 20,633 | | |

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Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Link 2AR: 2A Reach

Inflow Area = 73.409 ac, 56.57% Impervious, Inflow Depth = 2.60" for 10-yr event
Inflow = 192.53 cfs @ 12.14 hrs, Volume= 15.881 af
Primary = 190.66 cfs @ 12.25 hrs, Volume= 15.881 af, Atten= 1%, Lag= 6.9 min

Primary outflow = Inflow delayed by 6.9 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Summary for Link 2BR: 2B Reach

Inflow Area = 1.841 ac, 12.33% Impervious, Inflow Depth = 2.70" for 10-yr event
Inflow = 4.26 cfs @ 12.21 hrs, Volume= 0.414 af
Primary = 4.23 cfs @ 12.34 hrs, Volume= 0.414 af, Atten= 1%, Lag= 8.1 min

Primary outflow = Inflow delayed by 8.0 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Link 3AR: 3A Reach

Inflow Area = 28.772 ac, 35.84% Impervious, Inflow Depth = 1.79" for 10-yr event
Inflow = 37.13 cfs @ 12.36 hrs, Volume= 4.296 af
Primary = 37.04 cfs @ 12.42 hrs, Volume= 4.296 af, Atten= 0%, Lag= 3.7 min

Primary outflow = Inflow delayed by 3.7 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Existing Conditions

Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Link 3BR: 3B Reach

Inflow Area = 22.528 ac, 6.64% Impervious, Inflow Depth = 1.64" for 10-yr event
Inflow = 28.71 cfs @ 12.31 hrs, Volume= 3.080 af
Primary = 28.64 cfs @ 12.45 hrs, Volume= 3.080 af, Atten= 0%, Lag= 8.6 min

Primary outflow = Inflow delayed by 8.6 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Existing Conditions

Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Link DP-1: DP #1 - Rush Crk Trib.

Inflow Area = 69.450 ac, 17.61% Impervious, Inflow Depth = 1.92" for 10-yr event
Inflow = 80.09 cfs @ 12.37 hrs, Volume= 11.094 af
Primary = 80.09 cfs @ 12.37 hrs, Volume= 11.094 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Link DP-2: DP #2 - Smokes Crk

Inflow Area = 75.250 ac, 55.48% Impervious, Inflow Depth = 2.60" for 10-yr event
Inflow = 194.44 cfs @ 12.25 hrs, Volume= 16.295 af
Primary = 194.44 cfs @ 12.25 hrs, Volume= 16.295 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Summary for Link DP-3: DP #3 - Rush Crk

Inflow Area = 51.300 ac, 23.02% Impervious, Inflow Depth = 1.73" for 10-yr event
Inflow = 65.53 cfs @ 12.44 hrs, Volume= 7.376 af
Primary = 65.53 cfs @ 12.44 hrs, Volume= 7.376 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Existing Conditions

Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Link ET: Existing Conditions Total Offsite

Inflow Area = 196.000 ac, 33.57% Impervious, Inflow Depth = 2.13" for 10-yr event
Inflow = 319.89 cfs @ 12.29 hrs, Volume= 34.765 af
Primary = 319.89 cfs @ 12.29 hrs, Volume= 34.765 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Existing Conditions
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 1A-I: DA #1A-I

Runoff = 90.00 cfs @ 12.37 hrs, Volume= 10.586 af, Depth= 2.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.053 | 74 | >75% Grass cover, Good, HSG C |
| 32.764 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 10.684 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 7.171 | 96 | Gravel surface, HSG D |
| 1.631 | 77 | Woods, Good, HSG D |
| 52.303 | 86 | Weighted Average |
| 41.619 | | 79.57% Pervious Area |
| 10.684 | | 20.43% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 30.2 | 150 | 0.0110 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 1.4 | 139 | 0.0110 | 1.69 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 2.2 | 513 | 0.0060 | 3.90 | 102.86 | Trap/Vee/Rect Channel Flow, Bot.W=25.00' D=0.80' Z= 10.0 '/' Top.W=41.00' n= 0.022 Earth, clean & straight |
| 6.7 | 1,798 | | 4.50 | | Direct Entry, Pipe Flow |
| 40.5 | 2,600 | Total | | | |

Existing Conditions

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Existing Conditions
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 1A-II: DA #1A-II

Runoff = 80.77 cfs @ 11.98 hrs, Volume= 4.276 af, Depth= 2.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 4.803 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 1.545 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 10.799 | 96 | Gravel surface, HSG D |
| 17.147 | 92 | Weighted Average |
| 15.602 | | 90.99% Pervious Area |
| 1.545 | | 9.01% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 2.7 | 150 | 0.0100 | 0.94 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 0.3 | 25 | 0.0100 | 1.61 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 3.9 | 930 | 0.0100 | 3.93 | 33.44 | Trap/Vee/Rect Channel Flow, Bot.W=15.00' D=0.50' Z= 4.0 '/' Top.W=19.00' n= 0.022 Earth, clean & straight |
| 0.3 | 90 | | 4.50 | | Direct Entry, Pipe Flow |
| 7.2 | 1,195 | Total | | | |

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Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 2A: DA #2A

Runoff = 241.86 cfs @ 12.14 hrs, Volume= 20.206 af, Depth= 3.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 1.970 | 74 | >75% Grass cover, Good, HSG C |
| 4.741 | 80 | >75% Grass cover, Good, HSG D |
| 15.520 | 98 | Paved parking, HSG C |
| 26.004 | 98 | Paved parking, HSG D |
| 4.966 | 96 | Gravel surface, HSG C |
| 19.613 | 96 | Gravel surface, HSG D |
| 0.595 | 77 | Woods, Good, HSG D |
| 73.409 | 95 | Weighted Average |
| 31.885 | | 43.43% Pervious Area |
| 41.524 | | 56.57% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.9 | 98 | 0.0100 | 0.86 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 13.7 | 65 | 0.0150 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 0.7 | 80 | 0.0150 | 1.97 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 0.8 | 88 | 0.0090 | 1.93 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.8 | 360 | 0.0110 | 2.13 | | Shallow Concentrated Flow, Gravel Paved Kv= 20.3 fps |
| 1.7 | 446 | | 4.50 | | Direct Entry, Pipe Flow |
| 21.6 | 1,137 | Total | | | |

Existing Conditions

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Existing Conditions
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 2B: DA #2B

Runoff = 5.32 cfs @ 12.21 hrs, Volume= 0.523 af, Depth= 3.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.039 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 0.227 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 1.575 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 1.841 | 96 | Weighted Average |
| 1.614 | | 87.67% Pervious Area |
| 0.227 | | 12.33% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 9.4 | 47 | 0.0200 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 0.9 | 55 | 0.0200 | 1.01 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 9.6 | 48 | 0.0200 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 1.0 | 165 | 0.0270 | 2.65 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 1.3 | 210 | 0.0170 | 2.65 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 3.4 | 465 | 0.0200 | 2.28 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 0.2 | 30 | 0.0200 | 2.87 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.3 | 287 | 0.0170 | 2.10 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 28.1 | 1,307 | Total | | | |

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Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 3A: DA #3A

Runoff = 50.40 cfs @ 12.36 hrs, Volume= 5.824 af, Depth= 2.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 18.459 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 10.313 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 28.772 | 86 | Weighted Average |
| 18.459 | | 64.16% Pervious Area |
| 10.313 | | 35.84% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 31.4 | 150 | 0.0100 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 3.9 | 380 | 0.0100 | 1.61 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 1.2 | 146 | 0.0100 | 2.03 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.9 | 774 | | 4.50 | | Direct Entry, |
| 39.4 | 1,450 | Total | | | |

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Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 3B: DA #3B

Runoff = 39.69 cfs @ 12.31 hrs, Volume= 4.237 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 14.241 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 1.496 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 4.902 | 96 | Gravel surface, HSG D |
| 1.889 | 77 | Woods, Good, HSG D |
| 22.528 | 84 | Weighted Average |
| 21.032 | | 93.36% Pervious Area |
| 1.496 | | 6.64% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 26.7 | 150 | 0.0150 | 0.09 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 6.9 | 820 | 0.0150 | 1.97 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 1.5 | 315 | | 3.50 | | Direct Entry, Swale Flow |
| 35.1 | 1,285 | Total | | | |

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Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Pond ExP: Ex Pond

Inflow Area = 17.147 ac, 9.01% Impervious, Inflow Depth = 2.99" for 25-yr event
 Inflow = 80.77 cfs @ 11.98 hrs, Volume= 4.276 af
 Outflow = 21.50 cfs @ 12.15 hrs, Volume= 4.269 af, Atten= 73%, Lag= 10.1 min
 Primary = 21.50 cfs @ 12.15 hrs, Volume= 4.269 af

Routing by Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Peak Elev= 750.34' @ 12.15 hrs Surf.Area= 23,743 sf Storage= 60,660 cf

Plug-Flow detention time= 33.1 min calculated for 4.269 af (100% of inflow)
 Center-of-Mass det. time= 31.1 min (820.1 - 789.0)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|---|
| #1 | 742.60' | 77,688 cf | Exist. Swale (Prismatic) Listed below (Recalc) |
| #2 | 743.80' | 601 cf | 36.0" Round Pipe Storage L= 85.0' S= 0.0260 '/' |
| | | 78,289 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 742.60 | 1 | 0 | 0 |
| 743.00 | 245 | 49 | 49 |
| 744.00 | 2,744 | 1,495 | 1,544 |
| 745.00 | 3,915 | 3,330 | 4,873 |
| 746.00 | 5,216 | 4,566 | 9,439 |
| 747.00 | 6,916 | 6,066 | 15,505 |
| 748.00 | 9,428 | 8,172 | 23,677 |
| 749.00 | 13,835 | 11,632 | 35,308 |
| 750.00 | 20,462 | 17,149 | 52,457 |
| 751.00 | 30,000 | 25,231 | 77,688 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|---------|---|
| #1 | Primary | 742.29' | 30.0" Round Culvert L= 105.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 742.29' / 742.09' S= 0.0019 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf |
| #2 | Device 1 | 743.34' | 15.0" Round Culvert L= 25.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 743.34' / 742.98' S= 0.0144 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf |
| #3 | Device 1 | 750.84' | 24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads |
| #4 | Primary | 750.00' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=21.47 cfs @ 12.15 hrs HW=750.34' (Free Discharge)

- 1=Culvert (Passes 14.92 cfs of 61.65 cfs potential flow)
- 2=Culvert (Inlet Controls 14.92 cfs @ 12.16 fps)
- 3=Grate (Controls 0.00 cfs)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 6.55 cfs @ 1.92 fps)

Existing Conditions

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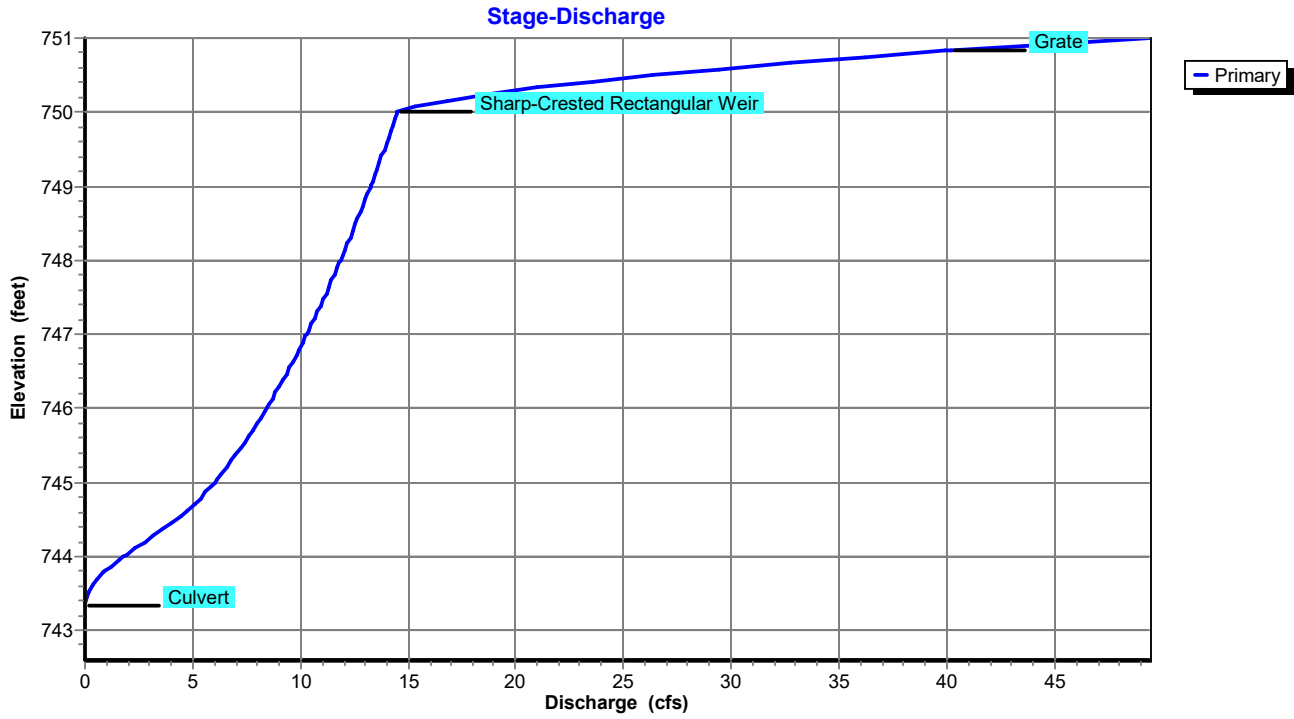
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Existing Conditions
Type II 24-hr 25-yr Rainfall=3.87"

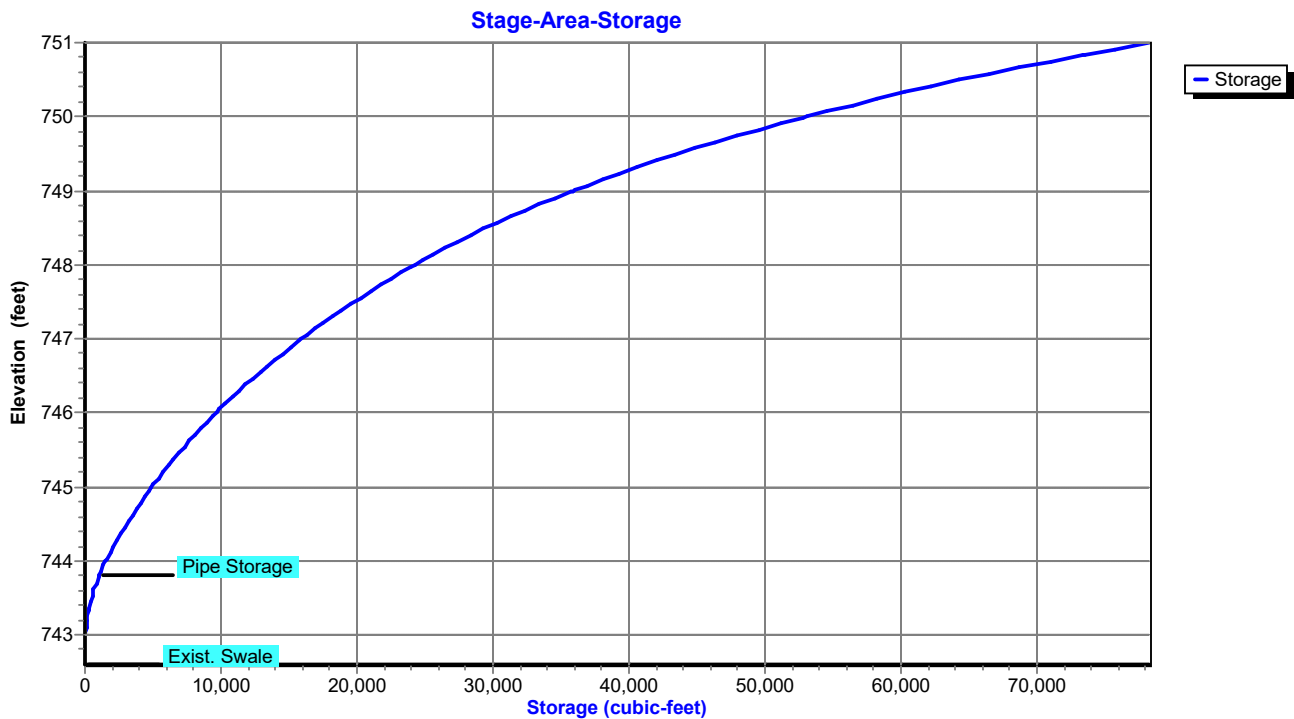
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Pond ExP: Ex Pond



Pond ExP: Ex Pond



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Type II 24-hr 25-yr Rainfall=3.87"

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Stage-Discharge for Pond ExP: Ex Pond

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---------------------|------------------|---------------------|------------------|
| 742.60 | 0.00 | 747.70 | 11.42 |
| 742.70 | 0.00 | 747.80 | 11.57 |
| 742.80 | 0.00 | 747.90 | 11.72 |
| 742.90 | 0.00 | 748.00 | 11.87 |
| 743.00 | 0.00 | 748.10 | 12.02 |
| 743.10 | 0.00 | 748.20 | 12.16 |
| 743.20 | 0.00 | 748.30 | 12.30 |
| 743.30 | 0.00 | 748.40 | 12.44 |
| 743.40 | 0.02 | 748.50 | 12.58 |
| 743.50 | 0.12 | 748.60 | 12.72 |
| 743.60 | 0.32 | 748.70 | 12.86 |
| 743.70 | 0.60 | 748.80 | 12.99 |
| 743.80 | 0.95 | 748.90 | 13.13 |
| 743.90 | 1.36 | 749.00 | 13.26 |
| 744.00 | 1.81 | 749.10 | 13.39 |
| 744.10 | 2.27 | 749.20 | 13.52 |
| 744.20 | 2.76 | 749.30 | 13.65 |
| 744.30 | 3.26 | 749.40 | 13.78 |
| 744.40 | 3.77 | 749.50 | 13.90 |
| 744.50 | 4.28 | 749.60 | 14.03 |
| 744.60 | 4.71 | 749.70 | 14.15 |
| 744.70 | 5.07 | 749.80 | 14.27 |
| 744.80 | 5.40 | 749.90 | 14.40 |
| 744.90 | 5.71 | 750.00 | 14.52 |
| 745.00 | 6.01 | 750.10 | 15.67 |
| 745.10 | 6.30 | 750.20 | 17.67 |
| 745.20 | 6.57 | 750.30 | 20.21 |
| 745.30 | 6.83 | 750.40 | 23.20 |
| 745.40 | 7.08 | 750.50 | 26.55 |
| 745.50 | 7.32 | 750.60 | 30.24 |
| 745.60 | 7.56 | 750.70 | 34.22 |
| 745.70 | 7.78 | 750.80 | 38.47 |
| 745.80 | 8.00 | 750.90 | 43.36 |
| 745.90 | 8.22 | 751.00 | 49.39 |
| 746.00 | 8.43 | | |
| 746.10 | 8.63 | | |
| 746.20 | 8.83 | | |
| 746.30 | 9.03 | | |
| 746.40 | 9.22 | | |
| 746.50 | 9.41 | | |
| 746.60 | 9.59 | | |
| 746.70 | 9.77 | | |
| 746.80 | 9.95 | | |
| 746.90 | 10.12 | | |
| 747.00 | 10.29 | | |
| 747.10 | 10.46 | | |
| 747.20 | 10.63 | | |
| 747.30 | 10.79 | | |
| 747.40 | 10.95 | | |
| 747.50 | 11.11 | | |
| 747.60 | 11.27 | | |

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Stage-Area-Storage for Pond ExP: Ex Pond

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---------------------|-------------------------|---------------------|-------------------------|
| 742.60 | 0 | 747.70 | 21,499 |
| 742.70 | 3 | 747.80 | 22,390 |
| 742.80 | 12 | 747.90 | 23,305 |
| 742.90 | 28 | 748.00 | 24,244 |
| 743.00 | 49 | 748.10 | 25,216 |
| 743.10 | 86 | 748.20 | 26,232 |
| 743.20 | 148 | 748.30 | 27,290 |
| 743.30 | 235 | 748.40 | 28,391 |
| 743.40 | 347 | 748.50 | 29,536 |
| 743.50 | 484 | 748.60 | 30,724 |
| 743.60 | 646 | 748.70 | 31,955 |
| 743.70 | 833 | 748.80 | 33,229 |
| 743.80 | 1,045 | 748.90 | 34,547 |
| 743.90 | 1,282 | 749.00 | 35,909 |
| 744.00 | 1,544 | 749.10 | 37,326 |
| 744.10 | 1,826 | 749.20 | 38,809 |
| 744.20 | 2,119 | 749.30 | 40,358 |
| 744.30 | 2,426 | 749.40 | 41,973 |
| 744.40 | 2,744 | 749.50 | 43,655 |
| 744.50 | 3,076 | 749.60 | 45,403 |
| 744.60 | 3,420 | 749.70 | 47,217 |
| 744.70 | 3,777 | 749.80 | 49,098 |
| 744.80 | 4,146 | 749.90 | 51,044 |
| 744.90 | 4,529 | 750.00 | 53,058 |
| 745.00 | 4,924 | 750.10 | 55,151 |
| 745.10 | 5,333 | 750.20 | 57,341 |
| 745.20 | 5,756 | 750.30 | 59,625 |
| 745.30 | 6,193 | 750.40 | 62,005 |
| 745.40 | 6,644 | 750.50 | 64,481 |
| 745.50 | 7,109 | 750.60 | 67,052 |
| 745.60 | 7,589 | 750.70 | 69,718 |
| 745.70 | 8,083 | 750.80 | 72,479 |
| 745.80 | 8,590 | 750.90 | 75,336 |
| 745.90 | 9,112 | 751.00 | 78,289 |
| 746.00 | 9,648 | | |
| 746.10 | 10,200 | | |
| 746.20 | 10,769 | | |
| 746.30 | 11,356 | | |
| 746.40 | 11,960 | | |
| 746.50 | 12,581 | | |
| 746.60 | 13,219 | | |
| 746.70 | 13,874 | | |
| 746.80 | 14,545 | | |
| 746.90 | 15,232 | | |
| 747.00 | 15,935 | | |
| 747.10 | 16,658 | | |
| 747.20 | 17,405 | | |
| 747.30 | 18,176 | | |
| 747.40 | 18,971 | | |
| 747.50 | 19,790 | | |
| 747.60 | 20,633 | | |

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Existing Conditions

Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Link 2AR: 2A Reach

Inflow Area = 73.409 ac, 56.57% Impervious, Inflow Depth = 3.30" for 25-yr event
Inflow = 241.86 cfs @ 12.14 hrs, Volume= 20.206 af
Primary = 239.52 cfs @ 12.25 hrs, Volume= 20.206 af, Atten= 1%, Lag= 6.9 min

Primary outflow = Inflow delayed by 6.9 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Summary for Link 2BR: 2B Reach

Inflow Area = 1.841 ac, 12.33% Impervious, Inflow Depth = 3.41" for 25-yr event
Inflow = 5.32 cfs @ 12.21 hrs, Volume= 0.523 af
Primary = 5.28 cfs @ 12.34 hrs, Volume= 0.523 af, Atten= 1%, Lag= 8.1 min

Primary outflow = Inflow delayed by 8.0 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Existing Conditions

Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Link 3AR: 3A Reach

Inflow Area = 28.772 ac, 35.84% Impervious, Inflow Depth = 2.43" for 25-yr event
Inflow = 50.40 cfs @ 12.36 hrs, Volume= 5.824 af
Primary = 50.27 cfs @ 12.42 hrs, Volume= 5.824 af, Atten= 0%, Lag= 3.7 min

Primary outflow = Inflow delayed by 3.7 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Summary for Link 3BR: 3B Reach

Inflow Area = 22.528 ac, 6.64% Impervious, Inflow Depth = 2.26" for 25-yr event
Inflow = 39.69 cfs @ 12.31 hrs, Volume= 4.237 af
Primary = 39.59 cfs @ 12.45 hrs, Volume= 4.237 af, Atten= 0%, Lag= 8.6 min

Primary outflow = Inflow delayed by 8.6 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Link DP-1: DP #1 - Rush Crk Trib.

Inflow Area = 69.450 ac, 17.61% Impervious, Inflow Depth = 2.57" for 25-yr event
Inflow = 106.13 cfs @ 12.35 hrs, Volume= 14.856 af
Primary = 106.13 cfs @ 12.35 hrs, Volume= 14.856 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Summary for Link DP-2: DP #2 - Smokes Crk

Inflow Area = 75.250 ac, 55.48% Impervious, Inflow Depth = 3.31" for 25-yr event
Inflow = 244.25 cfs @ 12.25 hrs, Volume= 20.729 af
Primary = 244.25 cfs @ 12.25 hrs, Volume= 20.729 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Summary for Link DP-3: DP #3 - Rush Crk

Inflow Area = 51.300 ac, 23.02% Impervious, Inflow Depth = 2.35" for 25-yr event
Inflow = 89.66 cfs @ 12.43 hrs, Volume= 10.061 af
Primary = 89.66 cfs @ 12.43 hrs, Volume= 10.061 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Existing Conditions

Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Link ET: Existing Conditions Total Offsite

Inflow Area = 196.000 ac, 33.57% Impervious, Inflow Depth = 2.79" for 25-yr event
Inflow = 415.86 cfs @ 12.29 hrs, Volume= 45.645 af
Primary = 415.86 cfs @ 12.29 hrs, Volume= 45.645 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Existing Conditions
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 1A-I: DA #1A-I

Runoff = 137.05 cfs @ 12.36 hrs, Volume= 16.213 af, Depth= 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.053 | 74 | >75% Grass cover, Good, HSG C |
| 32.764 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 10.684 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 7.171 | 96 | Gravel surface, HSG D |
| 1.631 | 77 | Woods, Good, HSG D |
| 52.303 | 86 | Weighted Average |
| 41.619 | | 79.57% Pervious Area |
| 10.684 | | 20.43% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 30.2 | 150 | 0.0110 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 1.4 | 139 | 0.0110 | 1.69 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 2.2 | 513 | 0.0060 | 3.90 | 102.86 | Trap/Vee/Rect Channel Flow, Bot.W=25.00' D=0.80' Z= 10.0 '/' Top.W=41.00' n= 0.022 Earth, clean & straight |
| 6.7 | 1,798 | | 4.50 | | Direct Entry, Pipe Flow |
| 40.5 | 2,600 | Total | | | |

Existing Conditions

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Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 1A-II: DA #1A-II

Runoff = 114.68 cfs @ 11.98 hrs, Volume= 6.220 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 4.803 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 1.545 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 10.799 | 96 | Gravel surface, HSG D |
| 17.147 | 92 | Weighted Average |
| 15.602 | | 90.99% Pervious Area |
| 1.545 | | 9.01% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 2.7 | 150 | 0.0100 | 0.94 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 0.3 | 25 | 0.0100 | 1.61 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 3.9 | 930 | 0.0100 | 3.93 | 33.44 | Trap/Vee/Rect Channel Flow, Bot.W=15.00' D=0.50' Z= 4.0 '/' Top.W=19.00' n= 0.022 Earth, clean & straight |
| 0.3 | 90 | | 4.50 | | Direct Entry, Pipe Flow |
| 7.2 | 1,195 | Total | | | |

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Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 2A: DA #2A

Runoff = 336.92 cfs @ 12.13 hrs, Volume= 28.673 af, Depth= 4.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 1.970 | 74 | >75% Grass cover, Good, HSG C |
| 4.741 | 80 | >75% Grass cover, Good, HSG D |
| 15.520 | 98 | Paved parking, HSG C |
| 26.004 | 98 | Paved parking, HSG D |
| 4.966 | 96 | Gravel surface, HSG C |
| 19.613 | 96 | Gravel surface, HSG D |
| 0.595 | 77 | Woods, Good, HSG D |
| 73.409 | 95 | Weighted Average |
| 31.885 | | 43.43% Pervious Area |
| 41.524 | | 56.57% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.9 | 98 | 0.0100 | 0.86 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 13.7 | 65 | 0.0150 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 0.7 | 80 | 0.0150 | 1.97 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 0.8 | 88 | 0.0090 | 1.93 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.8 | 360 | 0.0110 | 2.13 | | Shallow Concentrated Flow, Gravel Paved Kv= 20.3 fps |
| 1.7 | 446 | | 4.50 | | Direct Entry, Pipe Flow |
| 21.6 | 1,137 | Total | | | |

Existing Conditions

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Existing Conditions

Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 2B: DA #2B

Runoff = 7.36 cfs @ 12.21 hrs, Volume= 0.737 af, Depth= 4.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.039 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 0.227 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 1.575 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 1.841 | 96 | Weighted Average |
| 1.614 | | 87.67% Pervious Area |
| 0.227 | | 12.33% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 9.4 | 47 | 0.0200 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 0.9 | 55 | 0.0200 | 1.01 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 9.6 | 48 | 0.0200 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 1.0 | 165 | 0.0270 | 2.65 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 1.3 | 210 | 0.0170 | 2.65 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 3.4 | 465 | 0.0200 | 2.28 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 0.2 | 30 | 0.0200 | 2.87 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.3 | 287 | 0.0170 | 2.10 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 28.1 | 1,307 | Total | | | |

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Existing Conditions
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 3A: DA #3A

Runoff = 76.73 cfs @ 12.35 hrs, Volume= 8.919 af, Depth= 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 18.459 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 10.313 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 28.772 | 86 | Weighted Average |
| 18.459 | | 64.16% Pervious Area |
| 10.313 | | 35.84% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 31.4 | 150 | 0.0100 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 3.9 | 380 | 0.0100 | 1.61 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 1.2 | 146 | 0.0100 | 2.03 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.9 | 774 | | 4.50 | | Direct Entry, |
| 39.4 | 1,450 | Total | | | |

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Existing Conditions
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 3B: DA #3B

Runoff = 61.73 cfs @ 12.30 hrs, Volume= 6.605 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 14.241 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 1.496 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 4.902 | 96 | Gravel surface, HSG D |
| 1.889 | 77 | Woods, Good, HSG D |
| 22.528 | 84 | Weighted Average |
| 21.032 | | 93.36% Pervious Area |
| 1.496 | | 6.64% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 26.7 | 150 | 0.0150 | 0.09 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 6.9 | 820 | 0.0150 | 1.97 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 1.5 | 315 | | 3.50 | | Direct Entry, Swale Flow |
| 35.1 | 1,285 | Total | | | |

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Existing Conditions
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Pond ExP: Ex Pond

Inflow Area = 17.147 ac, 9.01% Impervious, Inflow Depth = 4.35" for 100-yr event
 Inflow = 114.68 cfs @ 11.98 hrs, Volume= 6.220 af
 Outflow = 75.03 cfs @ 12.10 hrs, Volume= 6.214 af, Atten= 35%, Lag= 6.9 min
 Primary = 75.03 cfs @ 12.10 hrs, Volume= 6.214 af

Routing by Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Peak Elev= 751.35' @ 12.09 hrs Surf.Area= 30,000 sf Storage= 78,289 cf

Plug-Flow detention time= 28.9 min calculated for 6.210 af (100% of inflow)
 Center-of-Mass det. time= 28.3 min (807.1 - 778.8)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|---|
| #1 | 742.60' | 77,688 cf | Exist. Swale (Prismatic) Listed below (Recalc) |
| #2 | 743.80' | 601 cf | 36.0" Round Pipe Storage L= 85.0' S= 0.0260 '/' |
| | | 78,289 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 742.60 | 1 | 0 | 0 |
| 743.00 | 245 | 49 | 49 |
| 744.00 | 2,744 | 1,495 | 1,544 |
| 745.00 | 3,915 | 3,330 | 4,873 |
| 746.00 | 5,216 | 4,566 | 9,439 |
| 747.00 | 6,916 | 6,066 | 15,505 |
| 748.00 | 9,428 | 8,172 | 23,677 |
| 749.00 | 13,835 | 11,632 | 35,308 |
| 750.00 | 20,462 | 17,149 | 52,457 |
| 751.00 | 30,000 | 25,231 | 77,688 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|---------|---|
| #1 | Primary | 742.29' | 30.0" Round Culvert L= 105.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 742.29' / 742.09' S= 0.0019 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf |
| #2 | Device 1 | 743.34' | 15.0" Round Culvert L= 25.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 743.34' / 742.98' S= 0.0144 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf |
| #3 | Device 1 | 750.84' | 24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads |
| #4 | Primary | 750.00' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=72.53 cfs @ 12.10 hrs HW=751.31' (Free Discharge)

- 1=Culvert (Passes 24.56 cfs of 65.90 cfs potential flow)
- 2=Culvert (Inlet Controls 16.02 cfs @ 13.05 fps)
- 3=Grate (Weir Controls 8.54 cfs @ 2.25 fps)
- 4=Sharp-Crested Rectangular Weir (Weir Controls 47.97 cfs @ 3.75 fps)

Existing Conditions

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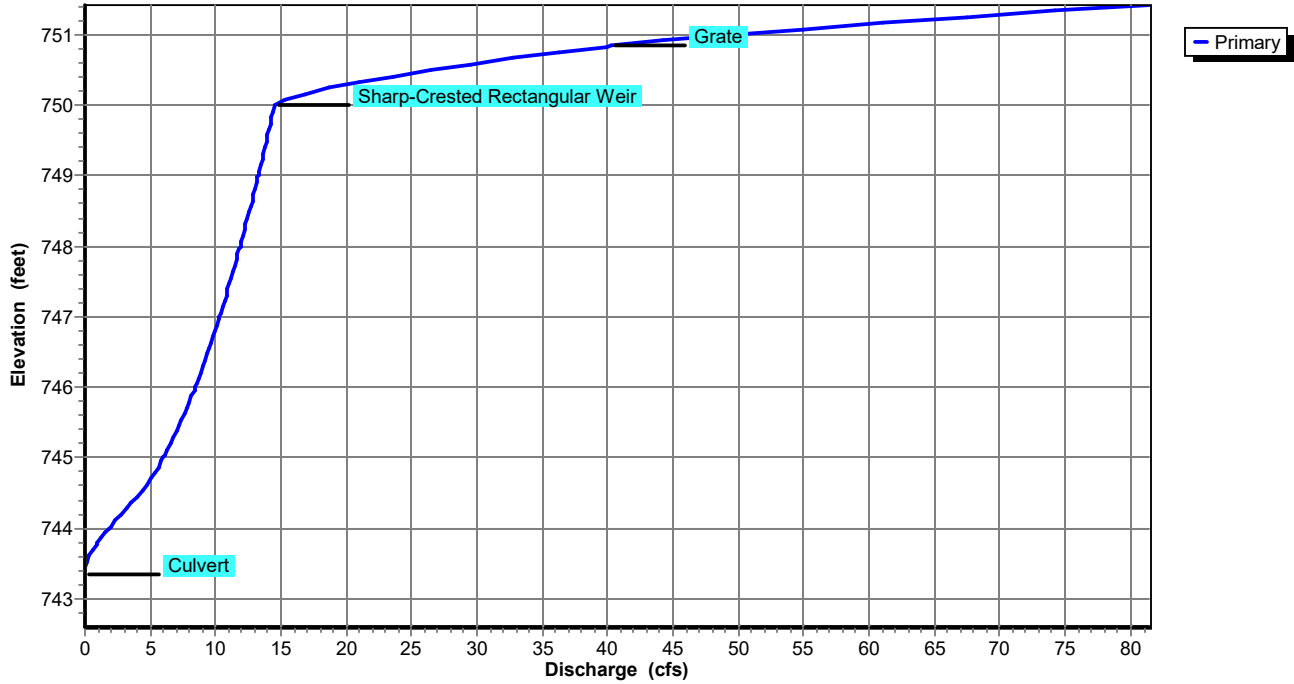
Existing Conditions
Type II 24-hr 100-yr Rainfall=5.27"

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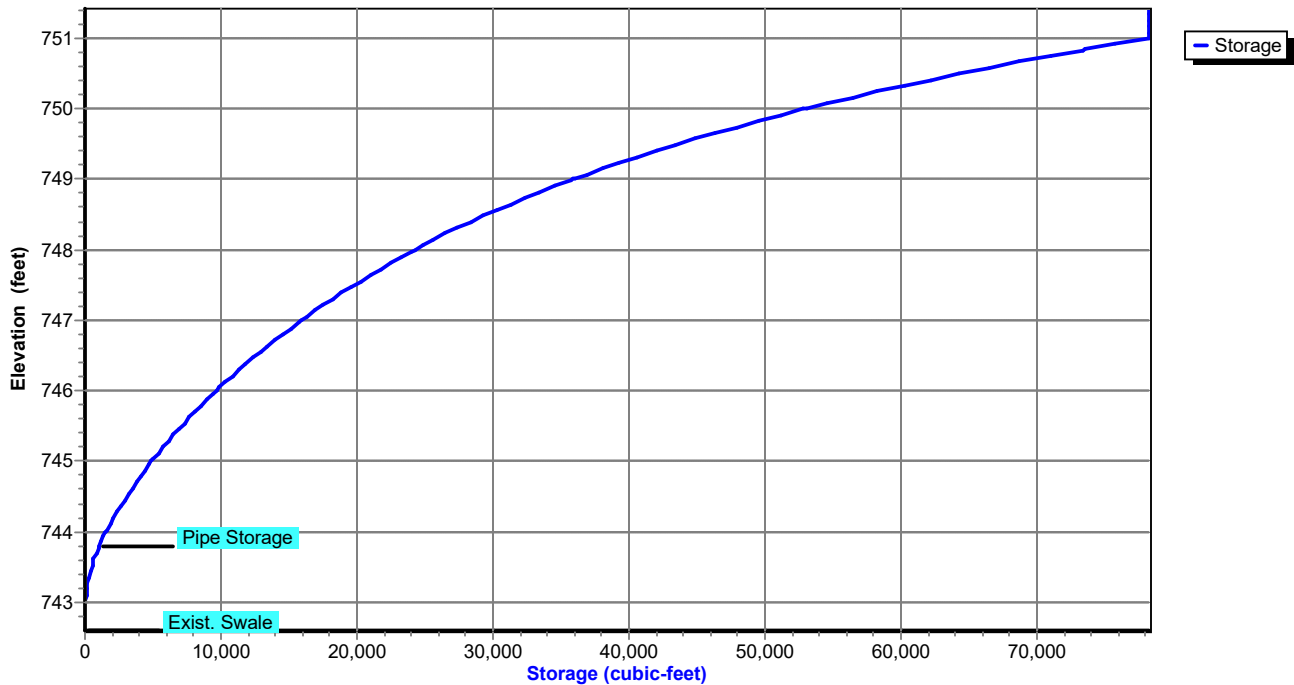
Pond ExP: Ex Pond

Stage-Discharge



Pond ExP: Ex Pond

Stage-Area-Storage



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Type II 24-hr 100-yr Rainfall=5.27"

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Stage-Discharge for Pond ExP: Ex Pond

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---------------------|------------------|---------------------|------------------|
| 742.60 | 0.00 | 747.70 | 11.42 |
| 742.70 | 0.00 | 747.80 | 11.57 |
| 742.80 | 0.00 | 747.90 | 11.72 |
| 742.90 | 0.00 | 748.00 | 11.87 |
| 743.00 | 0.00 | 748.10 | 12.02 |
| 743.10 | 0.00 | 748.20 | 12.16 |
| 743.20 | 0.00 | 748.30 | 12.30 |
| 743.30 | 0.00 | 748.40 | 12.44 |
| 743.40 | 0.02 | 748.50 | 12.58 |
| 743.50 | 0.12 | 748.60 | 12.72 |
| 743.60 | 0.32 | 748.70 | 12.86 |
| 743.70 | 0.60 | 748.80 | 12.99 |
| 743.80 | 0.95 | 748.90 | 13.13 |
| 743.90 | 1.36 | 749.00 | 13.26 |
| 744.00 | 1.81 | 749.10 | 13.39 |
| 744.10 | 2.27 | 749.20 | 13.52 |
| 744.20 | 2.76 | 749.30 | 13.65 |
| 744.30 | 3.26 | 749.40 | 13.78 |
| 744.40 | 3.77 | 749.50 | 13.90 |
| 744.50 | 4.28 | 749.60 | 14.03 |
| 744.60 | 4.71 | 749.70 | 14.15 |
| 744.70 | 5.07 | 749.80 | 14.27 |
| 744.80 | 5.40 | 749.90 | 14.40 |
| 744.90 | 5.71 | 750.00 | 14.52 |
| 745.00 | 6.01 | 750.10 | 15.67 |
| 745.10 | 6.30 | 750.20 | 17.67 |
| 745.20 | 6.57 | 750.30 | 20.21 |
| 745.30 | 6.83 | 750.40 | 23.20 |
| 745.40 | 7.08 | 750.50 | 26.55 |
| 745.50 | 7.32 | 750.60 | 30.24 |
| 745.60 | 7.56 | 750.70 | 34.22 |
| 745.70 | 7.78 | 750.80 | 38.47 |
| 745.80 | 8.00 | 750.90 | 43.36 |
| 745.90 | 8.22 | 751.00 | 49.39 |
| 746.00 | 8.43 | 751.10 | 56.15 |
| 746.10 | 8.63 | 751.20 | 63.50 |
| 746.20 | 8.83 | 751.30 | 71.37 |
| 746.30 | 9.03 | 751.40 | 79.73 |
| 746.40 | 9.22 | | |
| 746.50 | 9.41 | | |
| 746.60 | 9.59 | | |
| 746.70 | 9.77 | | |
| 746.80 | 9.95 | | |
| 746.90 | 10.12 | | |
| 747.00 | 10.29 | | |
| 747.10 | 10.46 | | |
| 747.20 | 10.63 | | |
| 747.30 | 10.79 | | |
| 747.40 | 10.95 | | |
| 747.50 | 11.11 | | |
| 747.60 | 11.27 | | |

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Existing Conditions

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Stage-Area-Storage for Pond ExP: Ex Pond

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---------------------|-------------------------|---------------------|-------------------------|
| 742.60 | 0 | 747.70 | 21,499 |
| 742.70 | 3 | 747.80 | 22,390 |
| 742.80 | 12 | 747.90 | 23,305 |
| 742.90 | 28 | 748.00 | 24,244 |
| 743.00 | 49 | 748.10 | 25,216 |
| 743.10 | 86 | 748.20 | 26,232 |
| 743.20 | 148 | 748.30 | 27,290 |
| 743.30 | 235 | 748.40 | 28,391 |
| 743.40 | 347 | 748.50 | 29,536 |
| 743.50 | 484 | 748.60 | 30,724 |
| 743.60 | 646 | 748.70 | 31,955 |
| 743.70 | 833 | 748.80 | 33,229 |
| 743.80 | 1,045 | 748.90 | 34,547 |
| 743.90 | 1,282 | 749.00 | 35,909 |
| 744.00 | 1,544 | 749.10 | 37,326 |
| 744.10 | 1,826 | 749.20 | 38,809 |
| 744.20 | 2,119 | 749.30 | 40,358 |
| 744.30 | 2,426 | 749.40 | 41,973 |
| 744.40 | 2,744 | 749.50 | 43,655 |
| 744.50 | 3,076 | 749.60 | 45,403 |
| 744.60 | 3,420 | 749.70 | 47,217 |
| 744.70 | 3,777 | 749.80 | 49,098 |
| 744.80 | 4,146 | 749.90 | 51,044 |
| 744.90 | 4,529 | 750.00 | 53,058 |
| 745.00 | 4,924 | 750.10 | 55,151 |
| 745.10 | 5,333 | 750.20 | 57,341 |
| 745.20 | 5,756 | 750.30 | 59,625 |
| 745.30 | 6,193 | 750.40 | 62,005 |
| 745.40 | 6,644 | 750.50 | 64,481 |
| 745.50 | 7,109 | 750.60 | 67,052 |
| 745.60 | 7,589 | 750.70 | 69,718 |
| 745.70 | 8,083 | 750.80 | 72,479 |
| 745.80 | 8,590 | 750.90 | 75,336 |
| 745.90 | 9,112 | 751.00 | 78,289 |
| 746.00 | 9,648 | 751.10 | 78,289 |
| 746.10 | 10,200 | 751.20 | 78,289 |
| 746.20 | 10,769 | 751.30 | 78,289 |
| 746.30 | 11,356 | 751.40 | 78,289 |
| 746.40 | 11,960 | | |
| 746.50 | 12,581 | | |
| 746.60 | 13,219 | | |
| 746.70 | 13,874 | | |
| 746.80 | 14,545 | | |
| 746.90 | 15,232 | | |
| 747.00 | 15,935 | | |
| 747.10 | 16,658 | | |
| 747.20 | 17,405 | | |
| 747.30 | 18,176 | | |
| 747.40 | 18,971 | | |
| 747.50 | 19,790 | | |
| 747.60 | 20,633 | | |

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Existing Conditions

Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Link 2AR: 2A Reach

Inflow Area = 73.409 ac, 56.57% Impervious, Inflow Depth = 4.69" for 100-yr event
Inflow = 336.92 cfs @ 12.13 hrs, Volume= 28.673 af
Primary = 333.68 cfs @ 12.25 hrs, Volume= 28.673 af, Atten= 1%, Lag= 6.9 min

Primary outflow = Inflow delayed by 6.9 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Existing Conditions

Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Link 2BR: 2B Reach

Inflow Area = 1.841 ac, 12.33% Impervious, Inflow Depth = 4.80" for 100-yr event
Inflow = 7.36 cfs @ 12.21 hrs, Volume= 0.737 af
Primary = 7.31 cfs @ 12.34 hrs, Volume= 0.737 af, Atten= 1%, Lag= 8.1 min

Primary outflow = Inflow delayed by 8.0 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Existing Conditions

Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Link 3AR: 3A Reach

Inflow Area = 28.772 ac, 35.84% Impervious, Inflow Depth = 3.72" for 100-yr event
Inflow = 76.73 cfs @ 12.35 hrs, Volume= 8.919 af
Primary = 76.53 cfs @ 12.41 hrs, Volume= 8.919 af, Atten= 0%, Lag= 3.8 min

Primary outflow = Inflow delayed by 3.7 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Existing Conditions

Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Link 3BR: 3B Reach

Inflow Area = 22.528 ac, 6.64% Impervious, Inflow Depth = 3.52" for 100-yr event
Inflow = 61.73 cfs @ 12.30 hrs, Volume= 6.605 af
Primary = 61.57 cfs @ 12.44 hrs, Volume= 6.605 af, Atten= 0%, Lag= 8.6 min

Primary outflow = Inflow delayed by 8.6 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

Existing Conditions

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Existing Conditions

Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Link DP-1: DP #1 - Rush Crk Trib.

Inflow Area = 69.450 ac, 17.61% Impervious, Inflow Depth = 3.88" for 100-yr event
Inflow = 162.21 cfs @ 12.33 hrs, Volume= 22.427 af
Primary = 162.21 cfs @ 12.33 hrs, Volume= 22.427 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Existing Conditions

Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Link DP-2: DP #2 - Smokes Crk

Inflow Area = 75.250 ac, 55.48% Impervious, Inflow Depth = 4.69" for 100-yr event
Inflow = 340.23 cfs @ 12.25 hrs, Volume= 29.409 af
Primary = 340.23 cfs @ 12.25 hrs, Volume= 29.409 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

Existing Conditions

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Existing Conditions

Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Link DP-3: DP #3 - Rush Crk

Inflow Area = 51.300 ac, 23.02% Impervious, Inflow Depth = 3.63" for 100-yr event
Inflow = 137.79 cfs @ 12.43 hrs, Volume= 15.524 af
Primary = 137.79 cfs @ 12.43 hrs, Volume= 15.524 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

Existing Conditions

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Existing Conditions

Type II 24-hr 100-yr Rainfall=5.27"

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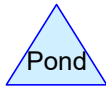
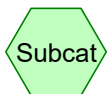
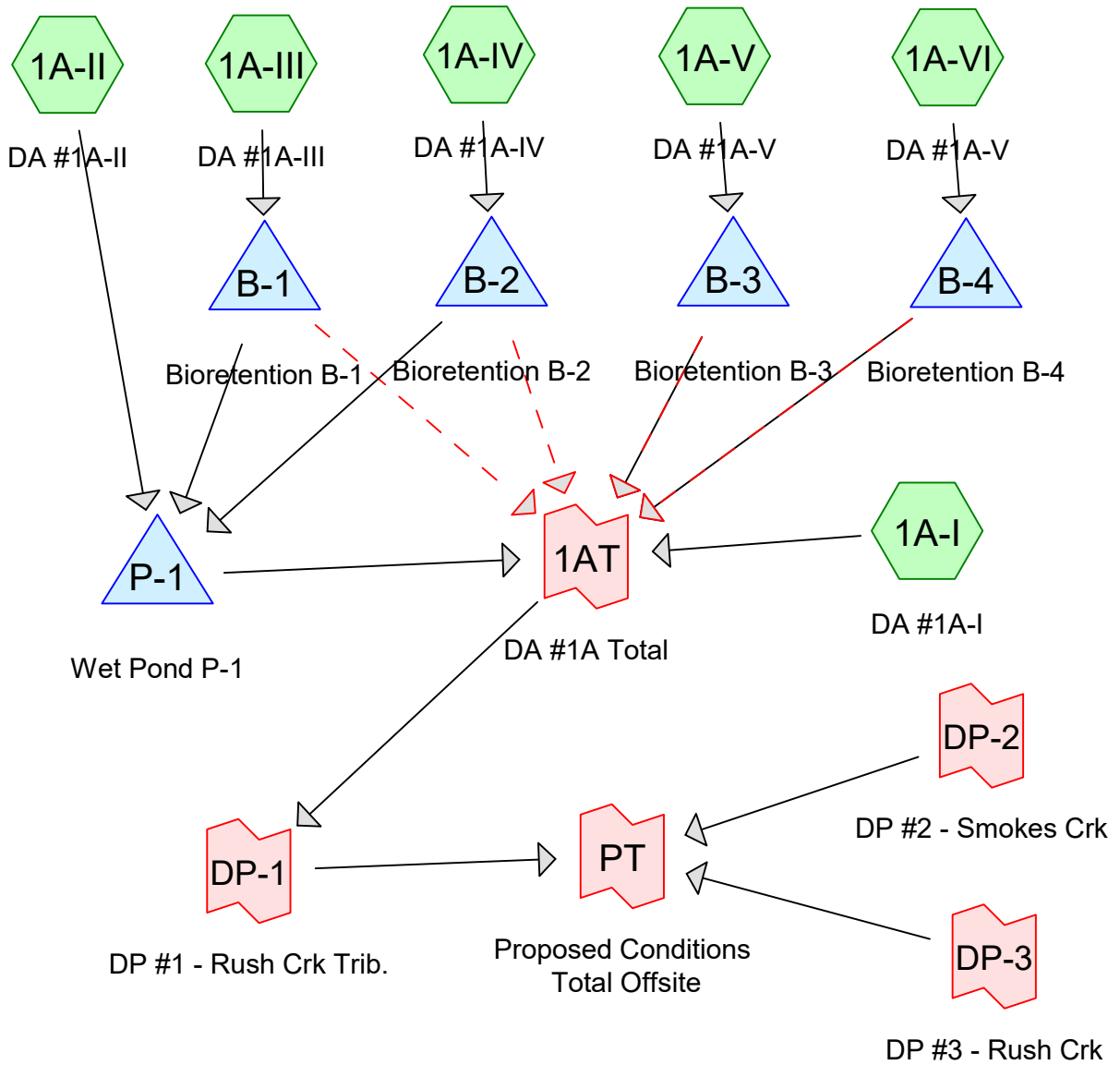
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Summary for Link ET: Existing Conditions Total Offsite

Inflow Area = 196.000 ac, 33.57% Impervious, Inflow Depth = 4.12" for 100-yr event
Inflow = 607.60 cfs @ 12.28 hrs, Volume= 67.360 af
Primary = 607.60 cfs @ 12.28 hrs, Volume= 67.360 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

Proposed Conditions - Report I of III, Drainage Area #1 & Total Proposed



Routing Diagram for Proposed Conditions I
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Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Page 2

Summary for Subcatchment 1A-I: DA #1A-I

Runoff = 18.87 cfs @ 12.28 hrs, Volume= 1.947 af, Depth= 0.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 11.558 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 13.442 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 1.044 | 77 | Woods, Good, HSG D |
| 26.044 | 89 | Weighted Average |
| 12.602 | | 48.39% Pervious Area |
| 13.442 | | 51.61% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 26.7 | 150 | 0.0150 | 0.09 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 2.9 | 340 | 0.0150 | 1.97 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 0.4 | 75 | 0.0200 | 2.87 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.8 | 760 | | 4.50 | | Direct Entry, Pipe Flow |
| 32.8 | 1,325 | Total | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Subcatchment 1A-II: DA #1A-II

Runoff = 18.84 cfs @ 11.97 hrs, Volume= 0.923 af, Depth= 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 2.746 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 6.783 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.587 | 77 | Woods, Good, HSG D |
| 10.116 | 92 | Weighted Average |
| 3.333 | | 32.95% Pervious Area |
| 6.783 | | 67.05% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.6 | 100 | 0.0170 | 1.07 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 0.9 | 140 | 0.0170 | 2.65 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.3 | 630 | | 4.50 | | Direct Entry, Pipe Flow |
| 4.8 | 870 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Subcatchment 1A-III: DA #1A-III

Runoff = 11.84 cfs @ 11.97 hrs, Volume= 0.599 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.883 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 4.519 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 5.402 | 95 | Weighted Average |
| 0.883 | | 16.35% Pervious Area |
| 4.519 | | 83.65% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.6 | 100 | 0.0170 | 1.07 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 1.3 | 205 | 0.0170 | 2.65 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.9 | 305 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Subcatchment 1A-IV: DA #1A-IV

Runoff = 12.57 cfs @ 11.97 hrs, Volume= 0.616 af, Depth= 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 2.082 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 4.668 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 6.750 | 92 | Weighted Average |
| 2.082 | | 30.84% Pervious Area |
| 4.668 | | 69.16% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|--|-------------------|----------------|--|
| 1.6 | 100 | 0.0170 | 1.07 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 0.7 | 110 | 0.0170 | 2.65 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.4 | 360 | | 2.50 | | Direct Entry, |
| 4.7 | 570 | Total, Increased to minimum Tc = 6.0 min | | | |

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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Subcatchment 1A-V: DA #1A-V

Runoff = 11.08 cfs @ 11.97 hrs, Volume= 0.553 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 1.233 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 4.088 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 5.321 | 94 | Weighted Average |
| 1.233 | | 23.17% Pervious Area |
| 4.088 | | 76.83% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.6 | 100 | 0.0170 | 1.07 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 1.4 | 225 | 0.0170 | 2.65 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 1.3 | 200 | | 2.50 | | Direct Entry, Swale Flow |
| 4.3 | 525 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Subcatchment 1A-VI: DA #1A-V

Runoff = 5.36 cfs @ 11.97 hrs, Volume= 0.267 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.542 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 2.030 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 2.572 | 94 | Weighted Average |
| 0.542 | | 21.07% Pervious Area |
| 2.030 | | 78.93% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.5 | 100 | 0.0200 | 1.14 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 2.0 | 350 | 0.0200 | 2.87 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 1.3 | 200 | | 2.50 | | Direct Entry, Swale Flow |
| 4.8 | 650 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Pond B-1: Bioretention B-1

Inflow Area = 5.402 ac, 83.65% Impervious, Inflow Depth = 1.33" for 1-yr event
 Inflow = 11.84 cfs @ 11.97 hrs, Volume= 0.599 af
 Outflow = 5.67 cfs @ 12.07 hrs, Volume= 0.444 af, Atten= 52%, Lag= 6.4 min
 Primary = 5.67 cfs @ 12.07 hrs, Volume= 0.444 af
 Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Peak Elev= 750.11' @ 12.07 hrs Surf.Area= 14,405 sf Storage= 11,882 cf

Plug-Flow detention time= 172.2 min calculated for 0.443 af (74% of inflow)
 Center-of-Mass det. time= 81.6 min (878.0 - 796.5)

| Volume | Invert | Avail.Storage | Storage Description |
|------------------|-------------------|------------------------|--|
| #1 | 749.25' | 29,200 cf | Surf. Storage (Prismatic) Listed below (Recalc) |
| | | | |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 749.25 | 13,200 | 0 | 0 |
| 751.25 | 16,000 | 29,200 | 29,200 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|---|
| #1 | Primary | 747.25' | 15.0" Round Culvert-Primary L= 87.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 747.25' / 747.00' S= 0.0029 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf |
| #2 | Device 1 | 749.75' | 24.0" x 24.0" Horiz. Grate-Primary C= 0.600 Limited to weir flow at low heads |
| #3 | Primary | 751.00' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |
| #4 | Secondary | 745.75' | 15.0" Round Culvert-Secondary L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 745.75' / 744.13' S= 0.0360 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf |
| #5 | Device 4 | 750.25' | 24.0" x 24.0" Horiz. Grate-Secondary C= 0.600 Limited to weir flow at low heads |

Primary OutFlow Max=5.52 cfs @ 12.07 hrs HW=750.10' TW=747.58' (Dynamic Tailwater)

- 1=Culvert-Primary (Passes 5.52 cfs of 7.46 cfs potential flow)
- 2=Grate-Primary (Weir Controls 5.52 cfs @ 1.95 fps)
- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=749.25' TW=0.00' (Dynamic Tailwater)

- 4=Culvert-Secondary (Passes 0.00 cfs of 10.02 cfs potential flow)
- 5=Grate-Secondary (Controls 0.00 cfs)

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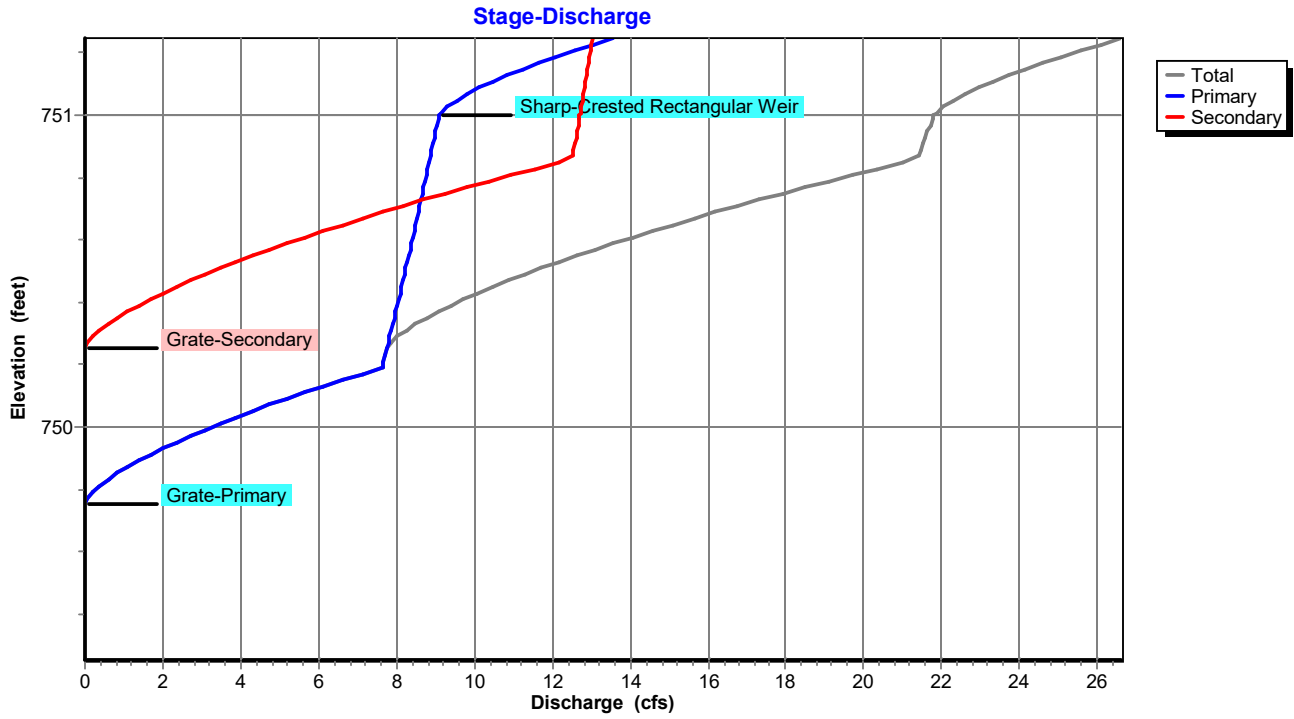
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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

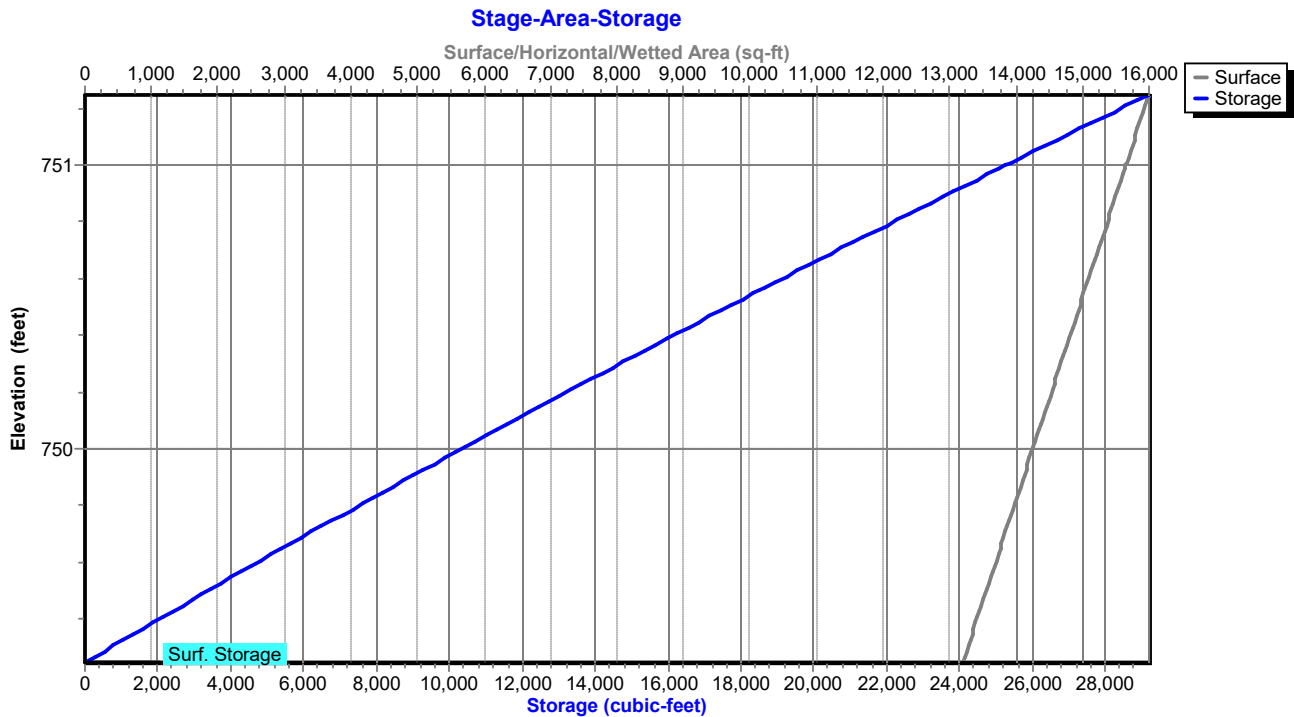
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Pond B-1: Bioretention B-1



Pond B-1: Bioretention B-1



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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Stage-Discharge for Pond B-1: Bioretention B-1

| Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) | Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) |
|---------------------|--------------------|------------------|--------------------|---------------------|--------------------|------------------|--------------------|
| 749.25 | 0.00 | 0.00 | 0.00 | 750.27 | 7.86 | 7.79 | 0.07 |
| 749.27 | 0.00 | 0.00 | 0.00 | 750.29 | 8.04 | 7.83 | 0.21 |
| 749.29 | 0.00 | 0.00 | 0.00 | 750.31 | 8.25 | 7.87 | 0.38 |
| 749.31 | 0.00 | 0.00 | 0.00 | 750.33 | 8.50 | 7.90 | 0.59 |
| 749.33 | 0.00 | 0.00 | 0.00 | 750.35 | 8.77 | 7.94 | 0.83 |
| 749.35 | 0.00 | 0.00 | 0.00 | 750.37 | 9.07 | 7.98 | 1.09 |
| 749.37 | 0.00 | 0.00 | 0.00 | 750.39 | 9.39 | 8.02 | 1.37 |
| 749.39 | 0.00 | 0.00 | 0.00 | 750.41 | 9.73 | 8.06 | 1.67 |
| 749.41 | 0.00 | 0.00 | 0.00 | 750.43 | 10.09 | 8.09 | 2.00 |
| 749.43 | 0.00 | 0.00 | 0.00 | 750.45 | 10.47 | 8.13 | 2.34 |
| 749.45 | 0.00 | 0.00 | 0.00 | 750.47 | 10.87 | 8.17 | 2.70 |
| 749.47 | 0.00 | 0.00 | 0.00 | 750.49 | 11.28 | 8.20 | 3.08 |
| 749.49 | 0.00 | 0.00 | 0.00 | 750.51 | 11.71 | 8.24 | 3.47 |
| 749.51 | 0.00 | 0.00 | 0.00 | 750.53 | 12.15 | 8.28 | 3.88 |
| 749.53 | 0.00 | 0.00 | 0.00 | 750.55 | 12.61 | 8.31 | 4.30 |
| 749.55 | 0.00 | 0.00 | 0.00 | 750.57 | 13.08 | 8.35 | 4.74 |
| 749.57 | 0.00 | 0.00 | 0.00 | 750.59 | 13.57 | 8.38 | 5.19 |
| 749.59 | 0.00 | 0.00 | 0.00 | 750.61 | 14.07 | 8.42 | 5.65 |
| 749.61 | 0.00 | 0.00 | 0.00 | 750.63 | 14.58 | 8.46 | 6.13 |
| 749.63 | 0.00 | 0.00 | 0.00 | 750.65 | 15.11 | 8.49 | 6.62 |
| 749.65 | 0.00 | 0.00 | 0.00 | 750.67 | 15.65 | 8.53 | 7.12 |
| 749.67 | 0.00 | 0.00 | 0.00 | 750.69 | 16.20 | 8.56 | 7.64 |
| 749.69 | 0.00 | 0.00 | 0.00 | 750.71 | 16.76 | 8.60 | 8.16 |
| 749.71 | 0.00 | 0.00 | 0.00 | 750.73 | 17.33 | 8.63 | 8.70 |
| 749.73 | 0.00 | 0.00 | 0.00 | 750.75 | 17.91 | 8.67 | 9.25 |
| 749.75 | 0.00 | 0.00 | 0.00 | 750.77 | 18.51 | 8.70 | 9.81 |
| 749.77 | 0.07 | 0.07 | 0.00 | 750.79 | 19.12 | 8.73 | 10.38 |
| 749.79 | 0.21 | 0.21 | 0.00 | 750.81 | 19.73 | 8.77 | 10.96 |
| 749.81 | 0.38 | 0.38 | 0.00 | 750.83 | 20.36 | 8.80 | 11.56 |
| 749.83 | 0.59 | 0.59 | 0.00 | 750.85 | 21.00 | 8.84 | 12.16 |
| 749.85 | 0.83 | 0.83 | 0.00 | 750.87 | 21.40 | 8.87 | 12.53 |
| 749.87 | 1.09 | 1.09 | 0.00 | 750.89 | 21.46 | 8.91 | 12.56 |
| 749.89 | 1.37 | 1.37 | 0.00 | 750.91 | 21.52 | 8.94 | 12.58 |
| 749.91 | 1.67 | 1.67 | 0.00 | 750.93 | 21.58 | 8.97 | 12.61 |
| 749.93 | 2.00 | 2.00 | 0.00 | 750.95 | 21.64 | 9.01 | 12.64 |
| 749.95 | 2.34 | 2.34 | 0.00 | 750.97 | 21.71 | 9.04 | 12.67 |
| 749.97 | 2.70 | 2.70 | 0.00 | 750.99 | 21.77 | 9.07 | 12.69 |
| 749.99 | 3.08 | 3.08 | 0.00 | 751.01 | 21.86 | 9.14 | 12.72 |
| 750.01 | 3.47 | 3.47 | 0.00 | 751.03 | 22.06 | 9.31 | 12.75 |
| 750.03 | 3.88 | 3.88 | 0.00 | 751.05 | 22.31 | 9.54 | 12.78 |
| 750.05 | 4.30 | 4.30 | 0.00 | 751.07 | 22.61 | 9.81 | 12.80 |
| 750.07 | 4.74 | 4.74 | 0.00 | 751.09 | 22.95 | 10.12 | 12.83 |
| 750.09 | 5.19 | 5.19 | 0.00 | 751.11 | 23.32 | 10.46 | 12.86 |
| 750.11 | 5.65 | 5.65 | 0.00 | 751.13 | 23.71 | 10.83 | 12.88 |
| 750.13 | 6.13 | 6.13 | 0.00 | 751.15 | 24.14 | 11.23 | 12.91 |
| 750.15 | 6.62 | 6.62 | 0.00 | 751.17 | 24.59 | 11.65 | 12.94 |
| 750.17 | 7.12 | 7.12 | 0.00 | 751.19 | 25.06 | 12.10 | 12.97 |
| 750.19 | 7.63 | 7.63 | 0.00 | 751.21 | 25.56 | 12.56 | 12.99 |
| 750.21 | 7.67 | 7.67 | 0.00 | 751.23 | 26.07 | 13.05 | 13.02 |
| 750.23 | 7.71 | 7.71 | 0.00 | 751.25 | 26.61 | 13.56 | 13.05 |
| 750.25 | 7.75 | 7.75 | 0.00 | | | | |

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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Stage-Area-Storage for Pond B-1: Bioretention B-1

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 749.25 | 13,200 | 0 | 750.27 | 14,628 | 14,192 |
| 749.27 | 13,228 | 264 | 750.29 | 14,656 | 14,485 |
| 749.29 | 13,256 | 529 | 750.31 | 14,684 | 14,779 |
| 749.31 | 13,284 | 795 | 750.33 | 14,712 | 15,072 |
| 749.33 | 13,312 | 1,060 | 750.35 | 14,740 | 15,367 |
| 749.35 | 13,340 | 1,327 | 750.37 | 14,768 | 15,662 |
| 749.37 | 13,368 | 1,594 | 750.39 | 14,796 | 15,958 |
| 749.39 | 13,396 | 1,862 | 750.41 | 14,824 | 16,254 |
| 749.41 | 13,424 | 2,130 | 750.43 | 14,852 | 16,551 |
| 749.43 | 13,452 | 2,399 | 750.45 | 14,880 | 16,848 |
| 749.45 | 13,480 | 2,668 | 750.47 | 14,908 | 17,146 |
| 749.47 | 13,508 | 2,938 | 750.49 | 14,936 | 17,444 |
| 749.49 | 13,536 | 3,208 | 750.51 | 14,964 | 17,743 |
| 749.51 | 13,564 | 3,479 | 750.53 | 14,992 | 18,043 |
| 749.53 | 13,592 | 3,751 | 750.55 | 15,020 | 18,343 |
| 749.55 | 13,620 | 4,023 | 750.57 | 15,048 | 18,644 |
| 749.57 | 13,648 | 4,296 | 750.59 | 15,076 | 18,945 |
| 749.59 | 13,676 | 4,569 | 750.61 | 15,104 | 19,247 |
| 749.61 | 13,704 | 4,843 | 750.63 | 15,132 | 19,549 |
| 749.63 | 13,732 | 5,117 | 750.65 | 15,160 | 19,852 |
| 749.65 | 13,760 | 5,392 | 750.67 | 15,188 | 20,155 |
| 749.67 | 13,788 | 5,667 | 750.69 | 15,216 | 20,460 |
| 749.69 | 13,816 | 5,944 | 750.71 | 15,244 | 20,764 |
| 749.71 | 13,844 | 6,220 | 750.73 | 15,272 | 21,069 |
| 749.73 | 13,872 | 6,497 | 750.75 | 15,300 | 21,375 |
| 749.75 | 13,900 | 6,775 | 750.77 | 15,328 | 21,681 |
| 749.77 | 13,928 | 7,053 | 750.79 | 15,356 | 21,988 |
| 749.79 | 13,956 | 7,332 | 750.81 | 15,384 | 22,296 |
| 749.81 | 13,984 | 7,612 | 750.83 | 15,412 | 22,603 |
| 749.83 | 14,012 | 7,891 | 750.85 | 15,440 | 22,912 |
| 749.85 | 14,040 | 8,172 | 750.87 | 15,468 | 23,221 |
| 749.87 | 14,068 | 8,453 | 750.89 | 15,496 | 23,531 |
| 749.89 | 14,096 | 8,735 | 750.91 | 15,524 | 23,841 |
| 749.91 | 14,124 | 9,017 | 750.93 | 15,552 | 24,152 |
| 749.93 | 14,152 | 9,300 | 750.95 | 15,580 | 24,463 |
| 749.95 | 14,180 | 9,583 | 750.97 | 15,608 | 24,775 |
| 749.97 | 14,208 | 9,867 | 750.99 | 15,636 | 25,087 |
| 749.99 | 14,236 | 10,151 | 751.01 | 15,664 | 25,400 |
| 750.01 | 14,264 | 10,436 | 751.03 | 15,692 | 25,714 |
| 750.03 | 14,292 | 10,722 | 751.05 | 15,720 | 26,028 |
| 750.05 | 14,320 | 11,008 | 751.07 | 15,748 | 26,343 |
| 750.07 | 14,348 | 11,295 | 751.09 | 15,776 | 26,658 |
| 750.09 | 14,376 | 11,582 | 751.11 | 15,804 | 26,974 |
| 750.11 | 14,404 | 11,870 | 751.13 | 15,832 | 27,290 |
| 750.13 | 14,432 | 12,158 | 751.15 | 15,860 | 27,607 |
| 750.15 | 14,460 | 12,447 | 751.17 | 15,888 | 27,924 |
| 750.17 | 14,488 | 12,736 | 751.19 | 15,916 | 28,243 |
| 750.19 | 14,516 | 13,027 | 751.21 | 15,944 | 28,561 |
| 750.21 | 14,544 | 13,317 | 751.23 | 15,972 | 28,880 |
| 750.23 | 14,572 | 13,608 | 751.25 | 16,000 | 29,200 |
| 750.25 | 14,600 | 13,900 | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Pond B-2: Bioretention B-2

Inflow Area = 6.750 ac, 69.16% Impervious, Inflow Depth = 1.09" for 1-yr event
 Inflow = 12.57 cfs @ 11.97 hrs, Volume= 0.616 af
 Outflow = 2.85 cfs @ 12.14 hrs, Volume= 0.422 af, Atten= 77%, Lag= 10.4 min
 Primary = 2.85 cfs @ 12.14 hrs, Volume= 0.422 af
 Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Peak Elev= 750.23' @ 12.14 hrs Surf.Area= 20,462 sf Storage= 12,912 cf

Plug-Flow detention time= 208.3 min calculated for 0.422 af (69% of inflow)
 Center-of-Mass det. time= 105.2 min (921.5 - 816.3)

| Volume | Invert | Avail.Storage | Storage Description |
|------------------|-------------------|------------------------|--|
| #1 | 749.50' | 45,000 cf | Surf. Storage (Prismatic) Listed below (Recalc) |
| | | | |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 749.50 | 15,000 | 0 | 0 |
| 751.50 | 30,000 | 45,000 | 45,000 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|--|
| #1 | Primary | 747.50' | 12.0" Round Culvert-Primary L= 105.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 747.50' / 747.25' S= 0.0024 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf |
| #2 | Device 1 | 750.00' | 24.0" x 24.0" Horiz. Grate-Primary C= 0.600 Limited to weir flow at low heads |
| #3 | Secondary | 746.00' | 12.0" Round Culvert-Secondary L= 130.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 746.00' / 738.10' S= 0.0608 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf |
| #4 | Device 3 | 750.75' | 24.0" x 24.0" Horiz. Grate-Secondary C= 0.600 Limited to weir flow at low heads |
| #5 | Primary | 751.00' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=2.84 cfs @ 12.14 hrs HW=750.23' TW=747.78' (Dynamic Tailwater)

- ↑ 1=Culvert-Primary (Passes 2.84 cfs of 4.27 cfs potential flow)
- ↑ 2=Grate-Primary (Weir Controls 2.84 cfs @ 1.56 fps)
- ↑ 5=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=749.50' TW=0.00' (Dynamic Tailwater)

- ↑ 3=Culvert-Secondary (Passes 0.00 cfs of 6.55 cfs potential flow)
- ↑ 4=Grate-Secondary (Controls 0.00 cfs)

Proposed Conditions I

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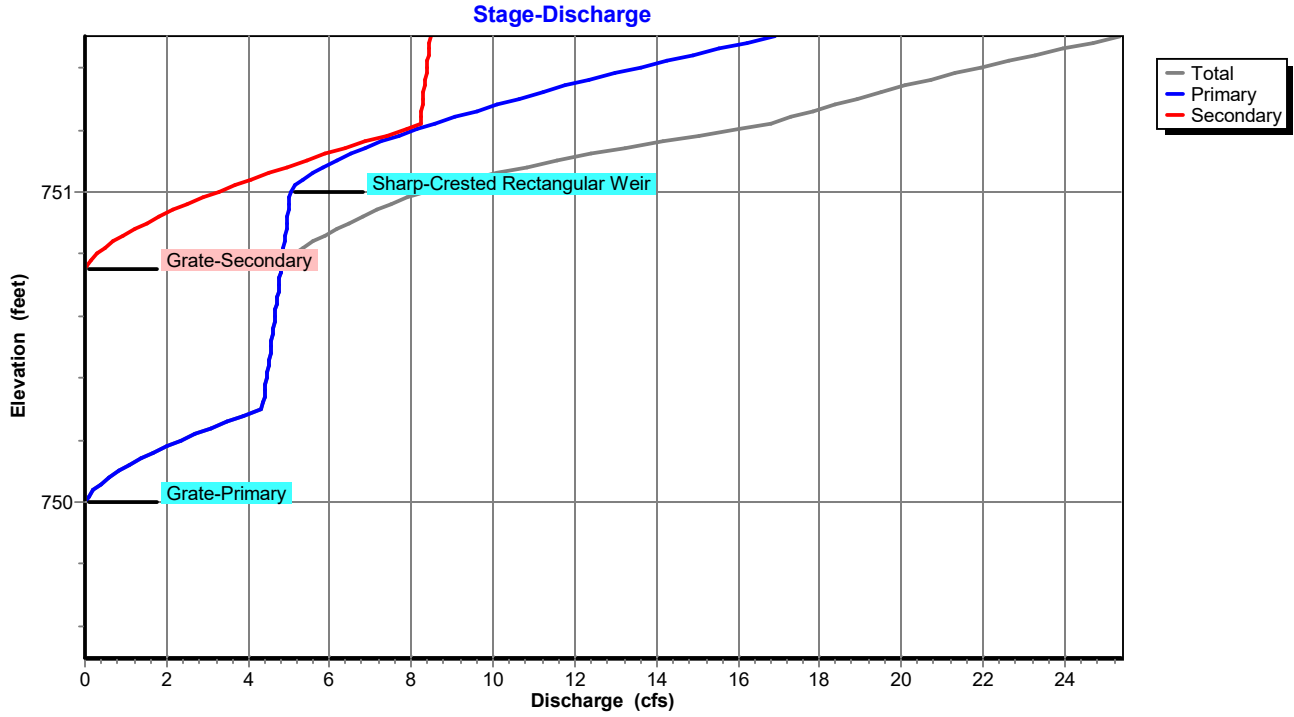
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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

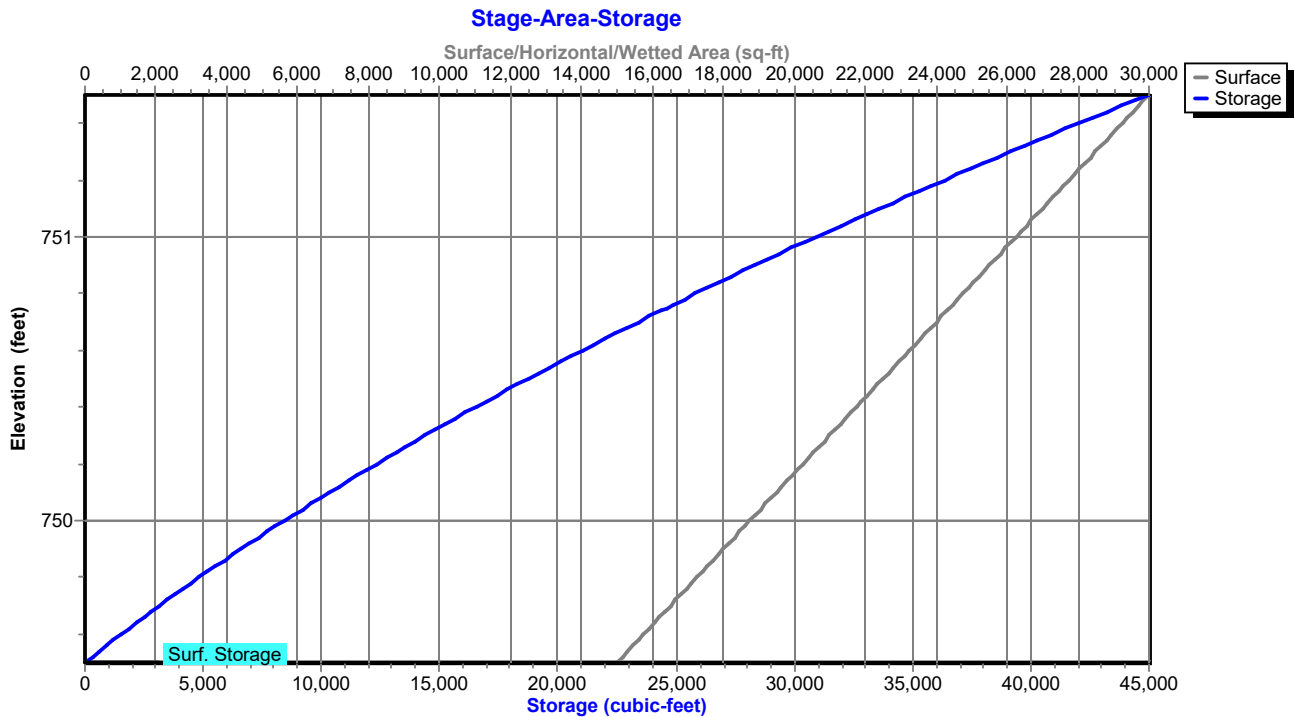
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Pond B-2: Bioretention B-2



Pond B-2: Bioretention B-2



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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Stage-Discharge for Pond B-2: Bioretention B-2

| Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) | Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) |
|---------------------|--------------------|------------------|--------------------|---------------------|--------------------|------------------|--------------------|
| 749.50 | 0.00 | 0.00 | 0.00 | 750.52 | 4.57 | 4.57 | 0.00 |
| 749.52 | 0.00 | 0.00 | 0.00 | 750.54 | 4.59 | 4.59 | 0.00 |
| 749.54 | 0.00 | 0.00 | 0.00 | 750.56 | 4.61 | 4.61 | 0.00 |
| 749.56 | 0.00 | 0.00 | 0.00 | 750.58 | 4.63 | 4.63 | 0.00 |
| 749.58 | 0.00 | 0.00 | 0.00 | 750.60 | 4.65 | 4.65 | 0.00 |
| 749.60 | 0.00 | 0.00 | 0.00 | 750.62 | 4.67 | 4.67 | 0.00 |
| 749.62 | 0.00 | 0.00 | 0.00 | 750.64 | 4.69 | 4.69 | 0.00 |
| 749.64 | 0.00 | 0.00 | 0.00 | 750.66 | 4.71 | 4.71 | 0.00 |
| 749.66 | 0.00 | 0.00 | 0.00 | 750.68 | 4.73 | 4.73 | 0.00 |
| 749.68 | 0.00 | 0.00 | 0.00 | 750.70 | 4.75 | 4.75 | 0.00 |
| 749.70 | 0.00 | 0.00 | 0.00 | 750.72 | 4.77 | 4.77 | 0.00 |
| 749.72 | 0.00 | 0.00 | 0.00 | 750.74 | 4.79 | 4.79 | 0.00 |
| 749.74 | 0.00 | 0.00 | 0.00 | 750.76 | 4.84 | 4.81 | 0.03 |
| 749.76 | 0.00 | 0.00 | 0.00 | 750.78 | 4.97 | 4.83 | 0.14 |
| 749.78 | 0.00 | 0.00 | 0.00 | 750.80 | 5.14 | 4.85 | 0.29 |
| 749.80 | 0.00 | 0.00 | 0.00 | 750.82 | 5.35 | 4.87 | 0.48 |
| 749.82 | 0.00 | 0.00 | 0.00 | 750.84 | 5.59 | 4.89 | 0.71 |
| 749.84 | 0.00 | 0.00 | 0.00 | 750.86 | 5.86 | 4.91 | 0.95 |
| 749.86 | 0.00 | 0.00 | 0.00 | 750.88 | 6.15 | 4.92 | 1.23 |
| 749.88 | 0.00 | 0.00 | 0.00 | 750.90 | 6.46 | 4.94 | 1.52 |
| 749.90 | 0.00 | 0.00 | 0.00 | 750.92 | 6.79 | 4.96 | 1.83 |
| 749.92 | 0.00 | 0.00 | 0.00 | 750.94 | 7.15 | 4.98 | 2.17 |
| 749.94 | 0.00 | 0.00 | 0.00 | 750.96 | 7.52 | 5.00 | 2.52 |
| 749.96 | 0.00 | 0.00 | 0.00 | 750.98 | 7.90 | 5.02 | 2.89 |
| 749.98 | 0.00 | 0.00 | 0.00 | 751.00 | 8.31 | 5.04 | 3.27 |
| 750.00 | 0.00 | 0.00 | 0.00 | 751.02 | 8.82 | 5.15 | 3.67 |
| 750.02 | 0.07 | 0.07 | 0.00 | 751.04 | 9.42 | 5.33 | 4.09 |
| 750.04 | 0.21 | 0.21 | 0.00 | 751.06 | 10.08 | 5.57 | 4.52 |
| 750.06 | 0.38 | 0.38 | 0.00 | 751.08 | 10.81 | 5.85 | 4.96 |
| 750.08 | 0.59 | 0.59 | 0.00 | 751.10 | 11.57 | 6.16 | 5.42 |
| 750.10 | 0.83 | 0.83 | 0.00 | 751.12 | 12.39 | 6.50 | 5.89 |
| 750.12 | 1.09 | 1.09 | 0.00 | 751.14 | 13.24 | 6.87 | 6.37 |
| 750.14 | 1.37 | 1.37 | 0.00 | 751.16 | 14.13 | 7.27 | 6.87 |
| 750.16 | 1.67 | 1.67 | 0.00 | 751.18 | 15.06 | 7.69 | 7.38 |
| 750.18 | 2.00 | 2.00 | 0.00 | 751.20 | 16.02 | 8.13 | 7.90 |
| 750.20 | 2.34 | 2.34 | 0.00 | 751.22 | 16.81 | 8.59 | 8.22 |
| 750.22 | 2.70 | 2.70 | 0.00 | 751.24 | 17.31 | 9.08 | 8.23 |
| 750.24 | 3.08 | 3.08 | 0.00 | 751.26 | 17.83 | 9.58 | 8.25 |
| 750.26 | 3.47 | 3.47 | 0.00 | 751.28 | 18.37 | 10.10 | 8.27 |
| 750.28 | 3.88 | 3.88 | 0.00 | 751.30 | 18.93 | 10.64 | 8.29 |
| 750.30 | 4.30 | 4.30 | 0.00 | 751.32 | 19.50 | 11.20 | 8.30 |
| 750.32 | 4.37 | 4.37 | 0.00 | 751.34 | 20.10 | 11.78 | 8.32 |
| 750.34 | 4.39 | 4.39 | 0.00 | 751.36 | 20.70 | 12.37 | 8.34 |
| 750.36 | 4.41 | 4.41 | 0.00 | 751.38 | 21.33 | 12.97 | 8.35 |
| 750.38 | 4.43 | 4.43 | 0.00 | 751.40 | 21.97 | 13.60 | 8.37 |
| 750.40 | 4.45 | 4.45 | 0.00 | 751.42 | 22.62 | 14.23 | 8.39 |
| 750.42 | 4.47 | 4.47 | 0.00 | 751.44 | 23.29 | 14.88 | 8.41 |
| 750.44 | 4.49 | 4.49 | 0.00 | 751.46 | 23.97 | 15.55 | 8.42 |
| 750.46 | 4.51 | 4.51 | 0.00 | 751.48 | 24.67 | 16.23 | 8.44 |
| 750.48 | 4.53 | 4.53 | 0.00 | 751.50 | 25.38 | 16.92 | 8.46 |
| 750.50 | 4.55 | 4.55 | 0.00 | | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Stage-Area-Storage for Pond B-2: Bioretention B-2

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 749.50 | 15,000 | 0 | 750.52 | 22,650 | 19,201 |
| 749.52 | 15,150 | 301 | 750.54 | 22,800 | 19,656 |
| 749.54 | 15,300 | 606 | 750.56 | 22,950 | 20,113 |
| 749.56 | 15,450 | 913 | 750.58 | 23,100 | 20,574 |
| 749.58 | 15,600 | 1,224 | 750.60 | 23,250 | 21,038 |
| 749.60 | 15,750 | 1,538 | 750.62 | 23,400 | 21,504 |
| 749.62 | 15,900 | 1,854 | 750.64 | 23,550 | 21,973 |
| 749.64 | 16,050 | 2,173 | 750.66 | 23,700 | 22,446 |
| 749.66 | 16,200 | 2,496 | 750.68 | 23,850 | 22,921 |
| 749.68 | 16,350 | 2,821 | 750.70 | 24,000 | 23,400 |
| 749.70 | 16,500 | 3,150 | 750.72 | 24,150 | 23,882 |
| 749.72 | 16,650 | 3,482 | 750.74 | 24,300 | 24,366 |
| 749.74 | 16,800 | 3,816 | 750.76 | 24,450 | 24,853 |
| 749.76 | 16,950 | 4,153 | 750.78 | 24,600 | 25,344 |
| 749.78 | 17,100 | 4,494 | 750.80 | 24,750 | 25,837 |
| 749.80 | 17,250 | 4,837 | 750.82 | 24,900 | 26,334 |
| 749.82 | 17,400 | 5,184 | 750.84 | 25,050 | 26,834 |
| 749.84 | 17,550 | 5,534 | 750.86 | 25,200 | 27,336 |
| 749.86 | 17,700 | 5,886 | 750.88 | 25,350 | 27,841 |
| 749.88 | 17,850 | 6,241 | 750.90 | 25,500 | 28,350 |
| 749.90 | 18,000 | 6,600 | 750.92 | 25,650 | 28,861 |
| 749.92 | 18,150 | 6,961 | 750.94 | 25,800 | 29,376 |
| 749.94 | 18,300 | 7,326 | 750.96 | 25,950 | 29,894 |
| 749.96 | 18,450 | 7,694 | 750.98 | 26,100 | 30,414 |
| 749.98 | 18,600 | 8,064 | 751.00 | 26,250 | 30,938 |
| 750.00 | 18,750 | 8,438 | 751.02 | 26,400 | 31,464 |
| 750.02 | 18,900 | 8,814 | 751.04 | 26,550 | 31,993 |
| 750.04 | 19,050 | 9,193 | 751.06 | 26,700 | 32,526 |
| 750.06 | 19,200 | 9,576 | 751.08 | 26,850 | 33,062 |
| 750.08 | 19,350 | 9,962 | 751.10 | 27,000 | 33,600 |
| 750.10 | 19,500 | 10,350 | 751.12 | 27,150 | 34,142 |
| 750.12 | 19,650 | 10,742 | 751.14 | 27,300 | 34,686 |
| 750.14 | 19,800 | 11,136 | 751.16 | 27,450 | 35,233 |
| 750.16 | 19,950 | 11,533 | 751.18 | 27,600 | 35,784 |
| 750.18 | 20,100 | 11,934 | 751.20 | 27,750 | 36,338 |
| 750.20 | 20,250 | 12,338 | 751.22 | 27,900 | 36,894 |
| 750.22 | 20,400 | 12,744 | 751.24 | 28,050 | 37,454 |
| 750.24 | 20,550 | 13,154 | 751.26 | 28,200 | 38,016 |
| 750.26 | 20,700 | 13,566 | 751.28 | 28,350 | 38,581 |
| 750.28 | 20,850 | 13,981 | 751.30 | 28,500 | 39,150 |
| 750.30 | 21,000 | 14,400 | 751.32 | 28,650 | 39,722 |
| 750.32 | 21,150 | 14,822 | 751.34 | 28,800 | 40,296 |
| 750.34 | 21,300 | 15,246 | 751.36 | 28,950 | 40,874 |
| 750.36 | 21,450 | 15,674 | 751.38 | 29,100 | 41,454 |
| 750.38 | 21,600 | 16,104 | 751.40 | 29,250 | 42,037 |
| 750.40 | 21,750 | 16,537 | 751.42 | 29,400 | 42,624 |
| 750.42 | 21,900 | 16,974 | 751.44 | 29,550 | 43,214 |
| 750.44 | 22,050 | 17,414 | 751.46 | 29,700 | 43,806 |
| 750.46 | 22,200 | 17,856 | 751.48 | 29,850 | 44,402 |
| 750.48 | 22,350 | 18,302 | 751.50 | 30,000 | 45,000 |
| 750.50 | 22,500 | 18,750 | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Pond B-3: Bioretention B-3

Inflow Area = 5.321 ac, 76.83% Impervious, Inflow Depth = 1.25" for 1-yr event
Inflow = 11.08 cfs @ 11.97 hrs, Volume= 0.553 af
Outflow = 3.35 cfs @ 12.10 hrs, Volume= 0.398 af, Atten= 70%, Lag= 8.0 min
Primary = 3.35 cfs @ 12.10 hrs, Volume= 0.398 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 750.80' @ 12.11 hrs Surf.Area= 16,791 sf Storage= 11,495 cf

Plug-Flow detention time= 183.9 min calculated for 0.398 af (72% of inflow)
Center-of-Mass det. time= 89.3 min (893.1 - 803.8)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|--|
| #1 | 750.00' | 36,000 cf | Surf. Storage (Prismatic) Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|------------------|-------------------|------------------------|------------------------|
| 750.00 | 12,000 | 0 | 0 |
| 752.00 | 24,000 | 36,000 | 36,000 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|---------|--|
| #1 | Primary | 746.50' | 8.0" Round Culvert-Primary L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 746.50' / 746.00' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf |
| #2 | Device 1 | 750.50' | 24.0" x 24.0" Horiz. Grate-Primary C= 0.600 Limited to weir flow at low heads |
| #3 | Primary | 751.50' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=3.35 cfs @ 12.10 hrs HW=750.80' TW=0.00' (Dynamic Tailwater)

1=Culvert-Primary (Inlet Controls 3.35 cfs @ 9.59 fps)
2=Grate-Primary (Passes 3.35 cfs of 4.25 cfs potential flow)
3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Proposed Conditions I

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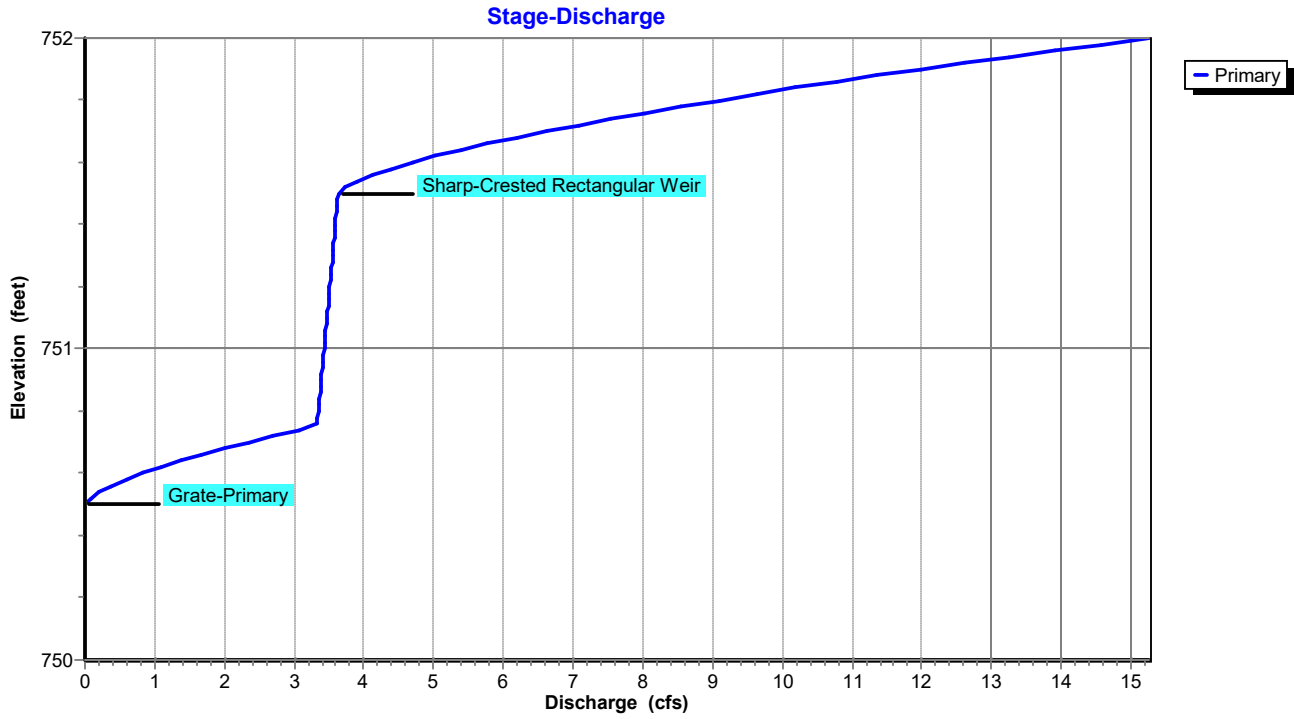
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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

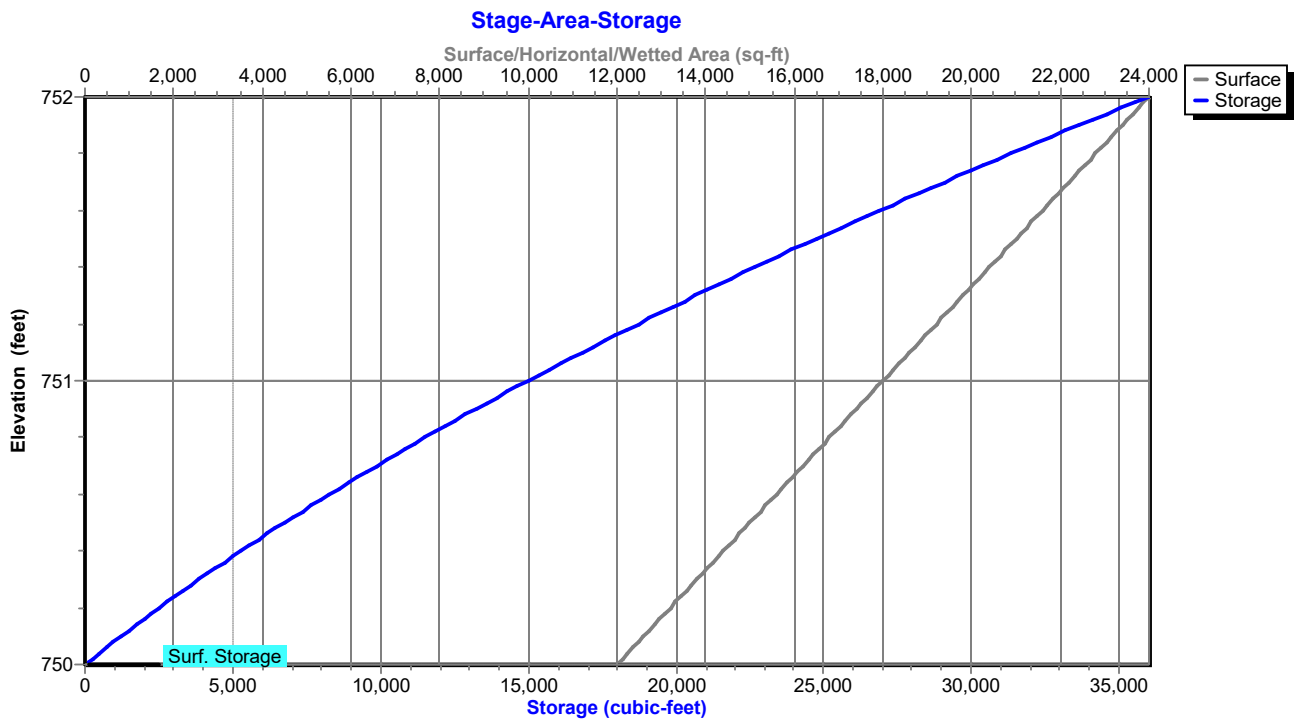
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Pond B-3: Bioretention B-3



Pond B-3: Bioretention B-3



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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Stage-Discharge for Pond B-3: Bioretention B-3

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|
| 750.00 | 0.00 | 750.51 | 0.03 | 751.02 | 3.44 | 751.53 | 3.81 |
| 750.01 | 0.00 | 750.52 | 0.07 | 751.03 | 3.44 | 751.54 | 3.91 |
| 750.02 | 0.00 | 750.53 | 0.14 | 751.04 | 3.45 | 751.55 | 4.01 |
| 750.03 | 0.00 | 750.54 | 0.21 | 751.05 | 3.45 | 751.56 | 4.13 |
| 750.04 | 0.00 | 750.55 | 0.29 | 751.06 | 3.46 | 751.57 | 4.26 |
| 750.05 | 0.00 | 750.56 | 0.38 | 751.07 | 3.46 | 751.58 | 4.40 |
| 750.06 | 0.00 | 750.57 | 0.48 | 751.08 | 3.46 | 751.59 | 4.55 |
| 750.07 | 0.00 | 750.58 | 0.59 | 751.09 | 3.47 | 751.60 | 4.70 |
| 750.08 | 0.00 | 750.59 | 0.71 | 751.10 | 3.47 | 751.61 | 4.86 |
| 750.09 | 0.00 | 750.60 | 0.83 | 751.11 | 3.48 | 751.62 | 5.03 |
| 750.10 | 0.00 | 750.61 | 0.95 | 751.12 | 3.48 | 751.63 | 5.21 |
| 750.11 | 0.00 | 750.62 | 1.09 | 751.13 | 3.48 | 751.64 | 5.39 |
| 750.12 | 0.00 | 750.63 | 1.23 | 751.14 | 3.49 | 751.65 | 5.58 |
| 750.13 | 0.00 | 750.64 | 1.37 | 751.15 | 3.49 | 751.66 | 5.78 |
| 750.14 | 0.00 | 750.65 | 1.52 | 751.16 | 3.50 | 751.67 | 5.98 |
| 750.15 | 0.00 | 750.66 | 1.67 | 751.17 | 3.50 | 751.68 | 6.19 |
| 750.16 | 0.00 | 750.67 | 1.83 | 751.18 | 3.50 | 751.69 | 6.40 |
| 750.17 | 0.00 | 750.68 | 2.00 | 751.19 | 3.51 | 751.70 | 6.62 |
| 750.18 | 0.00 | 750.69 | 2.17 | 751.20 | 3.51 | 751.71 | 6.84 |
| 750.19 | 0.00 | 750.70 | 2.34 | 751.21 | 3.52 | 751.72 | 7.07 |
| 750.20 | 0.00 | 750.71 | 2.52 | 751.22 | 3.52 | 751.73 | 7.31 |
| 750.21 | 0.00 | 750.72 | 2.70 | 751.23 | 3.52 | 751.74 | 7.55 |
| 750.22 | 0.00 | 750.73 | 2.89 | 751.24 | 3.53 | 751.75 | 7.79 |
| 750.23 | 0.00 | 750.74 | 3.08 | 751.25 | 3.53 | 751.76 | 8.04 |
| 750.24 | 0.00 | 750.75 | 3.27 | 751.26 | 3.54 | 751.77 | 8.29 |
| 750.25 | 0.00 | 750.76 | 3.33 | 751.27 | 3.54 | 751.78 | 8.55 |
| 750.26 | 0.00 | 750.77 | 3.33 | 751.28 | 3.54 | 751.79 | 8.81 |
| 750.27 | 0.00 | 750.78 | 3.34 | 751.29 | 3.55 | 751.80 | 9.08 |
| 750.28 | 0.00 | 750.79 | 3.34 | 751.30 | 3.55 | 751.81 | 9.35 |
| 750.29 | 0.00 | 750.80 | 3.35 | 751.31 | 3.56 | 751.82 | 9.63 |
| 750.30 | 0.00 | 750.81 | 3.35 | 751.32 | 3.56 | 751.83 | 9.91 |
| 750.31 | 0.00 | 750.82 | 3.36 | 751.33 | 3.56 | 751.84 | 10.19 |
| 750.32 | 0.00 | 750.83 | 3.36 | 751.34 | 3.57 | 751.85 | 10.48 |
| 750.33 | 0.00 | 750.84 | 3.36 | 751.35 | 3.57 | 751.86 | 10.78 |
| 750.34 | 0.00 | 750.85 | 3.37 | 751.36 | 3.58 | 751.87 | 11.07 |
| 750.35 | 0.00 | 750.86 | 3.37 | 751.37 | 3.58 | 751.88 | 11.37 |
| 750.36 | 0.00 | 750.87 | 3.38 | 751.38 | 3.58 | 751.89 | 11.68 |
| 750.37 | 0.00 | 750.88 | 3.38 | 751.39 | 3.59 | 751.90 | 11.98 |
| 750.38 | 0.00 | 750.89 | 3.39 | 751.40 | 3.59 | 751.91 | 12.30 |
| 750.39 | 0.00 | 750.90 | 3.39 | 751.41 | 3.60 | 751.92 | 12.61 |
| 750.40 | 0.00 | 750.91 | 3.39 | 751.42 | 3.60 | 751.93 | 12.93 |
| 750.41 | 0.00 | 750.92 | 3.40 | 751.43 | 3.60 | 751.94 | 13.25 |
| 750.42 | 0.00 | 750.93 | 3.40 | 751.44 | 3.61 | 751.95 | 13.58 |
| 750.43 | 0.00 | 750.94 | 3.41 | 751.45 | 3.61 | 751.96 | 13.91 |
| 750.44 | 0.00 | 750.95 | 3.41 | 751.46 | 3.62 | 751.97 | 14.24 |
| 750.45 | 0.00 | 750.96 | 3.41 | 751.47 | 3.62 | 751.98 | 14.58 |
| 750.46 | 0.00 | 750.97 | 3.42 | 751.48 | 3.62 | 751.99 | 14.92 |
| 750.47 | 0.00 | 750.98 | 3.42 | 751.49 | 3.63 | 752.00 | 15.26 |
| 750.48 | 0.00 | 750.99 | 3.43 | 751.50 | 3.63 | | |
| 750.49 | 0.00 | 751.00 | 3.43 | 751.51 | 3.67 | | |
| 750.50 | 0.00 | 751.01 | 3.43 | 751.52 | 3.73 | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Stage-Area-Storage for Pond B-3: Bioretention B-3

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 750.00 | 12,000 | 0 | 751.02 | 18,120 | 15,361 |
| 750.02 | 12,120 | 241 | 751.04 | 18,240 | 15,725 |
| 750.04 | 12,240 | 485 | 751.06 | 18,360 | 16,091 |
| 750.06 | 12,360 | 731 | 751.08 | 18,480 | 16,459 |
| 750.08 | 12,480 | 979 | 751.10 | 18,600 | 16,830 |
| 750.10 | 12,600 | 1,230 | 751.12 | 18,720 | 17,203 |
| 750.12 | 12,720 | 1,483 | 751.14 | 18,840 | 17,579 |
| 750.14 | 12,840 | 1,739 | 751.16 | 18,960 | 17,957 |
| 750.16 | 12,960 | 1,997 | 751.18 | 19,080 | 18,337 |
| 750.18 | 13,080 | 2,257 | 751.20 | 19,200 | 18,720 |
| 750.20 | 13,200 | 2,520 | 751.22 | 19,320 | 19,105 |
| 750.22 | 13,320 | 2,785 | 751.24 | 19,440 | 19,493 |
| 750.24 | 13,440 | 3,053 | 751.26 | 19,560 | 19,883 |
| 750.26 | 13,560 | 3,323 | 751.28 | 19,680 | 20,275 |
| 750.28 | 13,680 | 3,595 | 751.30 | 19,800 | 20,670 |
| 750.30 | 13,800 | 3,870 | 751.32 | 19,920 | 21,067 |
| 750.32 | 13,920 | 4,147 | 751.34 | 20,040 | 21,467 |
| 750.34 | 14,040 | 4,427 | 751.36 | 20,160 | 21,869 |
| 750.36 | 14,160 | 4,709 | 751.38 | 20,280 | 22,273 |
| 750.38 | 14,280 | 4,993 | 751.40 | 20,400 | 22,680 |
| 750.40 | 14,400 | 5,280 | 751.42 | 20,520 | 23,089 |
| 750.42 | 14,520 | 5,569 | 751.44 | 20,640 | 23,501 |
| 750.44 | 14,640 | 5,861 | 751.46 | 20,760 | 23,915 |
| 750.46 | 14,760 | 6,155 | 751.48 | 20,880 | 24,331 |
| 750.48 | 14,880 | 6,451 | 751.50 | 21,000 | 24,750 |
| 750.50 | 15,000 | 6,750 | 751.52 | 21,120 | 25,171 |
| 750.52 | 15,120 | 7,051 | 751.54 | 21,240 | 25,595 |
| 750.54 | 15,240 | 7,355 | 751.56 | 21,360 | 26,021 |
| 750.56 | 15,360 | 7,661 | 751.58 | 21,480 | 26,449 |
| 750.58 | 15,480 | 7,969 | 751.60 | 21,600 | 26,880 |
| 750.60 | 15,600 | 8,280 | 751.62 | 21,720 | 27,313 |
| 750.62 | 15,720 | 8,593 | 751.64 | 21,840 | 27,749 |
| 750.64 | 15,840 | 8,909 | 751.66 | 21,960 | 28,187 |
| 750.66 | 15,960 | 9,227 | 751.68 | 22,080 | 28,627 |
| 750.68 | 16,080 | 9,547 | 751.70 | 22,200 | 29,070 |
| 750.70 | 16,200 | 9,870 | 751.72 | 22,320 | 29,515 |
| 750.72 | 16,320 | 10,195 | 751.74 | 22,440 | 29,963 |
| 750.74 | 16,440 | 10,523 | 751.76 | 22,560 | 30,413 |
| 750.76 | 16,560 | 10,853 | 751.78 | 22,680 | 30,865 |
| 750.78 | 16,680 | 11,185 | 751.80 | 22,800 | 31,320 |
| 750.80 | 16,800 | 11,520 | 751.82 | 22,920 | 31,777 |
| 750.82 | 16,920 | 11,857 | 751.84 | 23,040 | 32,237 |
| 750.84 | 17,040 | 12,197 | 751.86 | 23,160 | 32,699 |
| 750.86 | 17,160 | 12,539 | 751.88 | 23,280 | 33,163 |
| 750.88 | 17,280 | 12,883 | 751.90 | 23,400 | 33,630 |
| 750.90 | 17,400 | 13,230 | 751.92 | 23,520 | 34,099 |
| 750.92 | 17,520 | 13,579 | 751.94 | 23,640 | 34,571 |
| 750.94 | 17,640 | 13,931 | 751.96 | 23,760 | 35,045 |
| 750.96 | 17,760 | 14,285 | 751.98 | 23,880 | 35,521 |
| 750.98 | 17,880 | 14,641 | 752.00 | 24,000 | 36,000 |
| 751.00 | 18,000 | 15,000 | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Pond B-4: Bioretention B-4

Inflow Area = 2.572 ac, 78.93% Impervious, Inflow Depth = 1.25" for 1-yr event
Inflow = 5.36 cfs @ 11.97 hrs, Volume= 0.267 af
Outflow = 3.34 cfs @ 12.05 hrs, Volume= 0.196 af, Atten= 38%, Lag= 5.2 min
Primary = 3.34 cfs @ 12.05 hrs, Volume= 0.196 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 753.75' @ 12.05 hrs Surf.Area= 6,753 sf Storage= 4,804 cf

Plug-Flow detention time= 163.5 min calculated for 0.196 af (73% of inflow)
Center-of-Mass det. time= 69.0 min (872.7 - 803.8)

| Volume | Invert | Avail.Storage | Storage Description |
|---------------------|----------------------|---------------------------|--|
| #1 | 753.00' | 14,000 cf | Surf. Storage (Prismatic) Listed below (Recalc) |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 753.00 | 6,000 | 0 | 0 |
| 755.00 | 8,000 | 14,000 | 14,000 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|---------|--|
| #1 | Primary | 749.50' | 12.0" Round Culvert-Primary L= 230.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 749.50' / 746.50' S= 0.0130 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf |
| #2 | Device 1 | 753.50' | 24.0" x 24.0" Horiz. Grate-Primary C= 0.600 Limited to weir flow at low heads |
| #3 | Primary | 754.50' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=3.30 cfs @ 12.05 hrs HW=753.75' TW=0.00' (Dynamic Tailwater)

- 1=Culvert-Primary (Passes 3.30 cfs of 5.70 cfs potential flow)
- 2=Grate-Primary (Weir Controls 3.30 cfs @ 1.64 fps)
- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Proposed Conditions I

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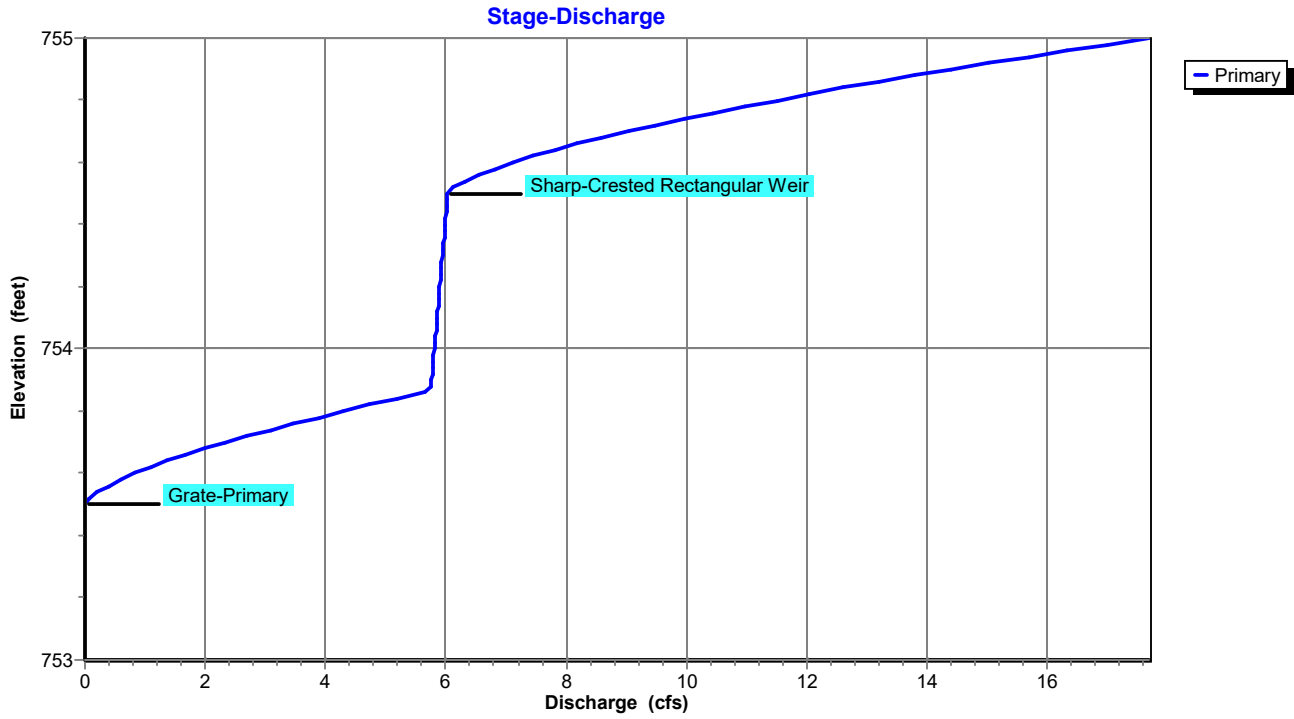
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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

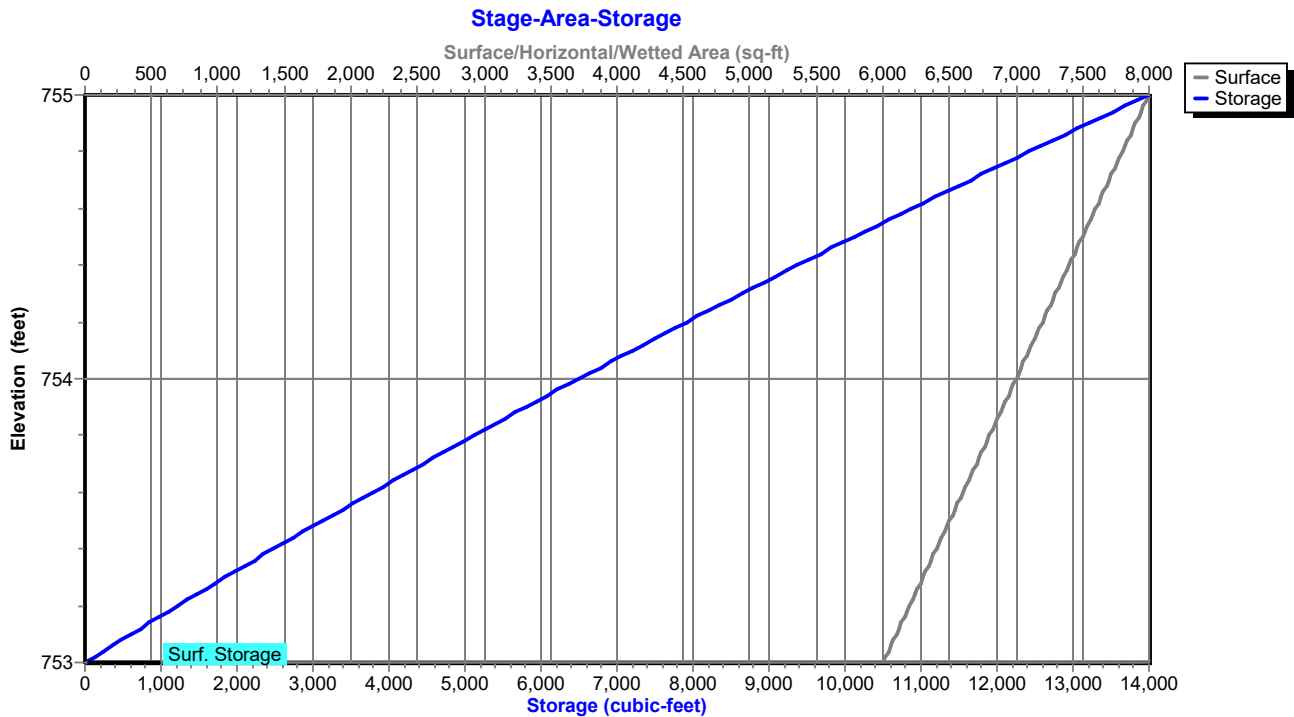
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Pond B-4: Bioretention B-4



Pond B-4: Bioretention B-4



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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Stage-Discharge for Pond B-4: Bioretention B-4

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|
| 753.00 | 0.00 | 753.51 | 0.03 | 754.02 | 5.82 | 754.53 | 6.21 |
| 753.01 | 0.00 | 753.52 | 0.07 | 754.03 | 5.82 | 754.54 | 6.31 |
| 753.02 | 0.00 | 753.53 | 0.14 | 754.04 | 5.83 | 754.55 | 6.41 |
| 753.03 | 0.00 | 753.54 | 0.21 | 754.05 | 5.83 | 754.56 | 6.53 |
| 753.04 | 0.00 | 753.55 | 0.29 | 754.06 | 5.84 | 754.57 | 6.66 |
| 753.05 | 0.00 | 753.56 | 0.38 | 754.07 | 5.84 | 754.58 | 6.80 |
| 753.06 | 0.00 | 753.57 | 0.48 | 754.08 | 5.84 | 754.59 | 6.95 |
| 753.07 | 0.00 | 753.58 | 0.59 | 754.09 | 5.85 | 754.60 | 7.10 |
| 753.08 | 0.00 | 753.59 | 0.71 | 754.10 | 5.85 | 754.61 | 7.27 |
| 753.09 | 0.00 | 753.60 | 0.83 | 754.11 | 5.86 | 754.62 | 7.44 |
| 753.10 | 0.00 | 753.61 | 0.95 | 754.12 | 5.86 | 754.63 | 7.61 |
| 753.11 | 0.00 | 753.62 | 1.09 | 754.13 | 5.87 | 754.64 | 7.80 |
| 753.12 | 0.00 | 753.63 | 1.23 | 754.14 | 5.87 | 754.65 | 7.99 |
| 753.13 | 0.00 | 753.64 | 1.37 | 754.15 | 5.88 | 754.66 | 8.18 |
| 753.14 | 0.00 | 753.65 | 1.52 | 754.16 | 5.88 | 754.67 | 8.38 |
| 753.15 | 0.00 | 753.66 | 1.67 | 754.17 | 5.88 | 754.68 | 8.59 |
| 753.16 | 0.00 | 753.67 | 1.83 | 754.18 | 5.89 | 754.69 | 8.81 |
| 753.17 | 0.00 | 753.68 | 2.00 | 754.19 | 5.89 | 754.70 | 9.03 |
| 753.18 | 0.00 | 753.69 | 2.17 | 754.20 | 5.90 | 754.71 | 9.25 |
| 753.19 | 0.00 | 753.70 | 2.34 | 754.21 | 5.90 | 754.72 | 9.48 |
| 753.20 | 0.00 | 753.71 | 2.52 | 754.22 | 5.91 | 754.73 | 9.72 |
| 753.21 | 0.00 | 753.72 | 2.70 | 754.23 | 5.91 | 754.74 | 9.96 |
| 753.22 | 0.00 | 753.73 | 2.89 | 754.24 | 5.91 | 754.75 | 10.20 |
| 753.23 | 0.00 | 753.74 | 3.08 | 754.25 | 5.92 | 754.76 | 10.45 |
| 753.24 | 0.00 | 753.75 | 3.27 | 754.26 | 5.92 | 754.77 | 10.71 |
| 753.25 | 0.00 | 753.76 | 3.47 | 754.27 | 5.93 | 754.78 | 10.96 |
| 753.26 | 0.00 | 753.77 | 3.67 | 754.28 | 5.93 | 754.79 | 11.23 |
| 753.27 | 0.00 | 753.78 | 3.88 | 754.29 | 5.94 | 754.80 | 11.50 |
| 753.28 | 0.00 | 753.79 | 4.09 | 754.30 | 5.94 | 754.81 | 11.77 |
| 753.29 | 0.00 | 753.80 | 4.30 | 754.31 | 5.95 | 754.82 | 12.05 |
| 753.30 | 0.00 | 753.81 | 4.52 | 754.32 | 5.95 | 754.83 | 12.33 |
| 753.31 | 0.00 | 753.82 | 4.74 | 754.33 | 5.95 | 754.84 | 12.61 |
| 753.32 | 0.00 | 753.83 | 4.96 | 754.34 | 5.96 | 754.85 | 12.90 |
| 753.33 | 0.00 | 753.84 | 5.19 | 754.35 | 5.96 | 754.86 | 13.19 |
| 753.34 | 0.00 | 753.85 | 5.42 | 754.36 | 5.97 | 754.87 | 13.49 |
| 753.35 | 0.00 | 753.86 | 5.65 | 754.37 | 5.97 | 754.88 | 13.79 |
| 753.36 | 0.00 | 753.87 | 5.75 | 754.38 | 5.98 | 754.89 | 14.10 |
| 753.37 | 0.00 | 753.88 | 5.75 | 754.39 | 5.98 | 754.90 | 14.40 |
| 753.38 | 0.00 | 753.89 | 5.76 | 754.40 | 5.98 | 754.91 | 14.72 |
| 753.39 | 0.00 | 753.90 | 5.76 | 754.41 | 5.99 | 754.92 | 15.03 |
| 753.40 | 0.00 | 753.91 | 5.77 | 754.42 | 5.99 | 754.93 | 15.35 |
| 753.41 | 0.00 | 753.92 | 5.77 | 754.43 | 6.00 | 754.94 | 15.67 |
| 753.42 | 0.00 | 753.93 | 5.78 | 754.44 | 6.00 | 754.95 | 16.00 |
| 753.43 | 0.00 | 753.94 | 5.78 | 754.45 | 6.01 | 754.96 | 16.33 |
| 753.44 | 0.00 | 753.95 | 5.79 | 754.46 | 6.01 | 754.97 | 16.66 |
| 753.45 | 0.00 | 753.96 | 5.79 | 754.47 | 6.01 | 754.98 | 17.00 |
| 753.46 | 0.00 | 753.97 | 5.80 | 754.48 | 6.02 | 754.99 | 17.34 |
| 753.47 | 0.00 | 753.98 | 5.80 | 754.49 | 6.02 | 755.00 | 17.68 |
| 753.48 | 0.00 | 753.99 | 5.80 | 754.50 | 6.03 | | |
| 753.49 | 0.00 | 754.00 | 5.81 | 754.51 | 6.06 | | |
| 753.50 | 0.00 | 754.01 | 5.81 | 754.52 | 6.13 | | |

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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Stage-Area-Storage for Pond B-4: Bioretention B-4

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 753.00 | 6,000 | 0 | 754.02 | 7,020 | 6,640 |
| 753.02 | 6,020 | 120 | 754.04 | 7,040 | 6,781 |
| 753.04 | 6,040 | 241 | 754.06 | 7,060 | 6,922 |
| 753.06 | 6,060 | 362 | 754.08 | 7,080 | 7,063 |
| 753.08 | 6,080 | 483 | 754.10 | 7,100 | 7,205 |
| 753.10 | 6,100 | 605 | 754.12 | 7,120 | 7,347 |
| 753.12 | 6,120 | 727 | 754.14 | 7,140 | 7,490 |
| 753.14 | 6,140 | 850 | 754.16 | 7,160 | 7,633 |
| 753.16 | 6,160 | 973 | 754.18 | 7,180 | 7,776 |
| 753.18 | 6,180 | 1,096 | 754.20 | 7,200 | 7,920 |
| 753.20 | 6,200 | 1,220 | 754.22 | 7,220 | 8,064 |
| 753.22 | 6,220 | 1,344 | 754.24 | 7,240 | 8,209 |
| 753.24 | 6,240 | 1,469 | 754.26 | 7,260 | 8,354 |
| 753.26 | 6,260 | 1,594 | 754.28 | 7,280 | 8,499 |
| 753.28 | 6,280 | 1,719 | 754.30 | 7,300 | 8,645 |
| 753.30 | 6,300 | 1,845 | 754.32 | 7,320 | 8,791 |
| 753.32 | 6,320 | 1,971 | 754.34 | 7,340 | 8,938 |
| 753.34 | 6,340 | 2,098 | 754.36 | 7,360 | 9,085 |
| 753.36 | 6,360 | 2,225 | 754.38 | 7,380 | 9,232 |
| 753.38 | 6,380 | 2,352 | 754.40 | 7,400 | 9,380 |
| 753.40 | 6,400 | 2,480 | 754.42 | 7,420 | 9,528 |
| 753.42 | 6,420 | 2,608 | 754.44 | 7,440 | 9,677 |
| 753.44 | 6,440 | 2,737 | 754.46 | 7,460 | 9,826 |
| 753.46 | 6,460 | 2,866 | 754.48 | 7,480 | 9,975 |
| 753.48 | 6,480 | 2,995 | 754.50 | 7,500 | 10,125 |
| 753.50 | 6,500 | 3,125 | 754.52 | 7,520 | 10,275 |
| 753.52 | 6,520 | 3,255 | 754.54 | 7,540 | 10,426 |
| 753.54 | 6,540 | 3,386 | 754.56 | 7,560 | 10,577 |
| 753.56 | 6,560 | 3,517 | 754.58 | 7,580 | 10,728 |
| 753.58 | 6,580 | 3,648 | 754.60 | 7,600 | 10,880 |
| 753.60 | 6,600 | 3,780 | 754.62 | 7,620 | 11,032 |
| 753.62 | 6,620 | 3,912 | 754.64 | 7,640 | 11,185 |
| 753.64 | 6,640 | 4,045 | 754.66 | 7,660 | 11,338 |
| 753.66 | 6,660 | 4,178 | 754.68 | 7,680 | 11,491 |
| 753.68 | 6,680 | 4,311 | 754.70 | 7,700 | 11,645 |
| 753.70 | 6,700 | 4,445 | 754.72 | 7,720 | 11,799 |
| 753.72 | 6,720 | 4,579 | 754.74 | 7,740 | 11,954 |
| 753.74 | 6,740 | 4,714 | 754.76 | 7,760 | 12,109 |
| 753.76 | 6,760 | 4,849 | 754.78 | 7,780 | 12,264 |
| 753.78 | 6,780 | 4,984 | 754.80 | 7,800 | 12,420 |
| 753.80 | 6,800 | 5,120 | 754.82 | 7,820 | 12,576 |
| 753.82 | 6,820 | 5,256 | 754.84 | 7,840 | 12,733 |
| 753.84 | 6,840 | 5,393 | 754.86 | 7,860 | 12,890 |
| 753.86 | 6,860 | 5,530 | 754.88 | 7,880 | 13,047 |
| 753.88 | 6,880 | 5,667 | 754.90 | 7,900 | 13,205 |
| 753.90 | 6,900 | 5,805 | 754.92 | 7,920 | 13,363 |
| 753.92 | 6,920 | 5,943 | 754.94 | 7,940 | 13,522 |
| 753.94 | 6,940 | 6,082 | 754.96 | 7,960 | 13,681 |
| 753.96 | 6,960 | 6,221 | 754.98 | 7,980 | 13,840 |
| 753.98 | 6,980 | 6,360 | 755.00 | 8,000 | 14,000 |
| 754.00 | 7,000 | 6,500 | | | |

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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Pond P-1: Wet Pond P-1

Inflow Area = 22.268 ac, 71.72% Impervious, Inflow Depth = 0.96" for 1-yr event
 Inflow = 23.50 cfs @ 11.99 hrs, Volume= 1.789 af
 Outflow = 1.15 cfs @ 15.14 hrs, Volume= 1.781 af, Atten= 95%, Lag= 188.9 min
 Primary = 1.15 cfs @ 15.14 hrs, Volume= 1.781 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Peak Elev= 748.63' @ 15.14 hrs Surf.Area= 38,048 sf Storage= 43,568 cf

Plug-Flow detention time= 497.9 min calculated for 1.781 af (100% of inflow)
 Center-of-Mass det. time= 494.4 min (1,350.8 - 856.4)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|--|
| #1 | 740.00' | 0 cf | Retention (Irregular) Listed below (Recalc) 24,499 cf Overall x 0.0% Voids |
| #2 | 746.00' | 133,484 cf | Detention (Irregular) Listed below (Recalc) |
| | | 133,484 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|------------------|-------------------|---------------|------------------------|------------------------|------------------|
| 740.00 | 651 | 103.0 | 0 | 0 | 651 |
| 741.50 | 2,244 | 1,016.0 | 2,052 | 2,052 | 81,955 |
| 745.00 | 4,383 | 391.0 | 11,390 | 13,442 | 151,977 |
| 746.50 | 10,839 | 632.0 | 11,057 | 24,499 | 171,611 |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|------------------|-------------------|---------------|------------------------|------------------------|------------------|
| 746.00 | 11,459 | 563.0 | 0 | 0 | 11,459 |
| 747.00 | 13,760 | 587.0 | 12,592 | 12,592 | 13,729 |
| 748.00 | 19,120 | 930.0 | 16,367 | 28,959 | 55,143 |
| 749.00 | 32,528 | 1,810.0 | 25,529 | 54,488 | 247,025 |
| 750.00 | 39,522 | 1,836.0 | 35,968 | 90,456 | 254,786 |
| 751.00 | 46,632 | 1,863.0 | 43,028 | 133,484 | 262,946 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|---------|--|
| #1 | Primary | 742.25' | 30.0" Round Culvert L= 85.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 742.25' / 742.09' S= 0.0019 '/ Cc= 0.900 n= 0.012, Flow Area= 4.91 sf |
| #2 | Device 1 | 748.65' | 30.0" W x 30.0" H 9° Gate C= 0.600 Limited to weir flow at low heads |
| #3 | Primary | 749.65' | 20.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |
| #4 | Device 1 | 746.00' | 6.0" Round Culvert-Low Flow L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 745.50' / 746.00' S= -0.0333 '/ Cc= 0.900 n= 0.012, Flow Area= 0.20 sf |

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Type II 24-hr 1-yr Rainfall=1.84"

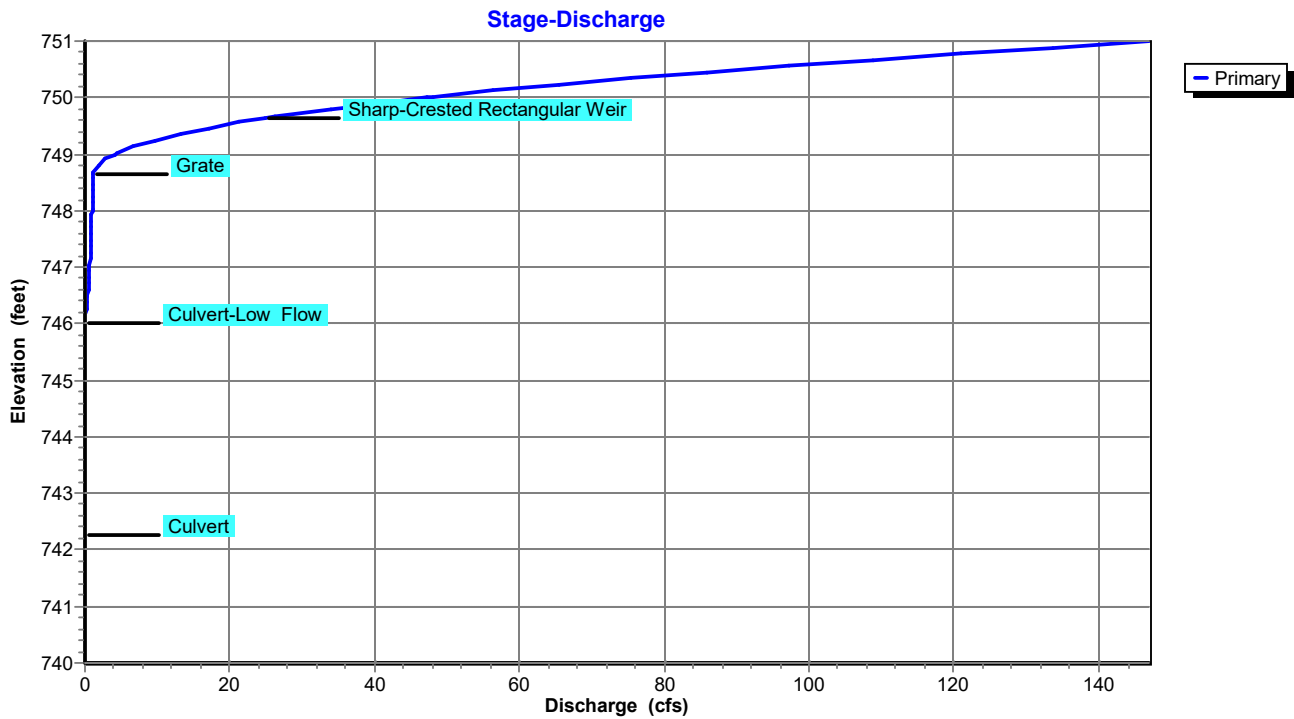
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Primary OutFlow Max=1.15 cfs @ 15.14 hrs HW=748.63' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 1.15 cfs of 53.55 cfs potential flow)
- 2=Gate (Controls 0.00 cfs)
- 4=Culvert-Low Flow (Inlet Controls 1.15 cfs @ 5.87 fps)
- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond P-1: Wet Pond P-1



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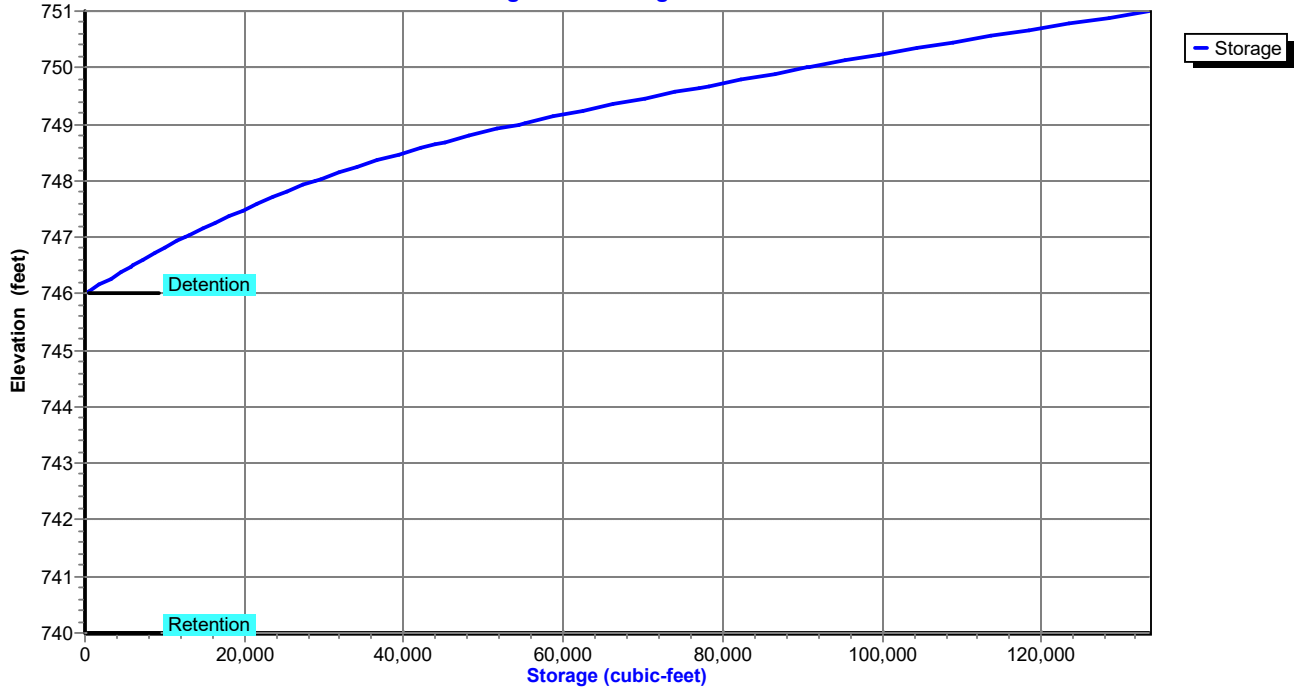
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Pond P-1: Wet Pond P-1

Stage-Area-Storage



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Type II 24-hr 1-yr Rainfall=1.84"

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Stage-Discharge for Pond P-1: Wet Pond P-1

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|
| 740.00 | 0.00 | 743.06 | 0.00 | 746.12 | 0.03 | 749.18 | 7.99 |
| 740.06 | 0.00 | 743.12 | 0.00 | 746.18 | 0.07 | 749.24 | 9.69 |
| 740.12 | 0.00 | 743.18 | 0.00 | 746.24 | 0.12 | 749.30 | 11.54 |
| 740.18 | 0.00 | 743.24 | 0.00 | 746.30 | 0.18 | 749.36 | 13.52 |
| 740.24 | 0.00 | 743.30 | 0.00 | 746.36 | 0.24 | 749.42 | 15.63 |
| 740.30 | 0.00 | 743.36 | 0.00 | 746.42 | 0.31 | 749.48 | 17.85 |
| 740.36 | 0.00 | 743.42 | 0.00 | 746.48 | 0.36 | 749.54 | 20.19 |
| 740.42 | 0.00 | 743.48 | 0.00 | 746.54 | 0.40 | 749.60 | 22.63 |
| 740.48 | 0.00 | 743.54 | 0.00 | 746.60 | 0.44 | 749.66 | 25.23 |
| 740.54 | 0.00 | 743.60 | 0.00 | 746.66 | 0.48 | 749.72 | 29.02 |
| 740.60 | 0.00 | 743.66 | 0.00 | 746.72 | 0.51 | 749.78 | 33.50 |
| 740.66 | 0.00 | 743.72 | 0.00 | 746.78 | 0.54 | 749.84 | 36.78 |
| 740.72 | 0.00 | 743.78 | 0.00 | 746.84 | 0.57 | 749.90 | 40.44 |
| 740.78 | 0.00 | 743.84 | 0.00 | 746.90 | 0.60 | 749.96 | 44.42 |
| 740.84 | 0.00 | 743.90 | 0.00 | 746.96 | 0.63 | 750.02 | 48.69 |
| 740.90 | 0.00 | 743.96 | 0.00 | 747.02 | 0.65 | 750.08 | 53.22 |
| 740.96 | 0.00 | 744.02 | 0.00 | 747.08 | 0.68 | 750.14 | 58.00 |
| 741.02 | 0.00 | 744.08 | 0.00 | 747.14 | 0.70 | 750.20 | 63.01 |
| 741.08 | 0.00 | 744.14 | 0.00 | 747.20 | 0.73 | 750.26 | 68.22 |
| 741.14 | 0.00 | 744.20 | 0.00 | 747.26 | 0.75 | 750.32 | 73.65 |
| 741.20 | 0.00 | 744.26 | 0.00 | 747.32 | 0.77 | 750.38 | 79.26 |
| 741.26 | 0.00 | 744.32 | 0.00 | 747.38 | 0.79 | 750.44 | 85.06 |
| 741.32 | 0.00 | 744.38 | 0.00 | 747.44 | 0.81 | 750.50 | 91.04 |
| 741.38 | 0.00 | 744.44 | 0.00 | 747.50 | 0.83 | 750.56 | 97.19 |
| 741.44 | 0.00 | 744.50 | 0.00 | 747.56 | 0.85 | 750.62 | 103.50 |
| 741.50 | 0.00 | 744.56 | 0.00 | 747.62 | 0.87 | 750.68 | 109.97 |
| 741.56 | 0.00 | 744.62 | 0.00 | 747.68 | 0.89 | 750.74 | 116.60 |
| 741.62 | 0.00 | 744.68 | 0.00 | 747.74 | 0.91 | 750.80 | 123.37 |
| 741.68 | 0.00 | 744.74 | 0.00 | 747.80 | 0.93 | 750.86 | 130.29 |
| 741.74 | 0.00 | 744.80 | 0.00 | 747.86 | 0.95 | 750.92 | 137.35 |
| 741.80 | 0.00 | 744.86 | 0.00 | 747.92 | 0.96 | 750.98 | 144.55 |
| 741.86 | 0.00 | 744.92 | 0.00 | 747.98 | 0.98 | | |
| 741.92 | 0.00 | 744.98 | 0.00 | 748.04 | 1.00 | | |
| 741.98 | 0.00 | 745.04 | 0.00 | 748.10 | 1.02 | | |
| 742.04 | 0.00 | 745.10 | 0.00 | 748.16 | 1.03 | | |
| 742.10 | 0.00 | 745.16 | 0.00 | 748.22 | 1.05 | | |
| 742.16 | 0.00 | 745.22 | 0.00 | 748.28 | 1.06 | | |
| 742.22 | 0.00 | 745.28 | 0.00 | 748.34 | 1.08 | | |
| 742.28 | 0.00 | 745.34 | 0.00 | 748.40 | 1.09 | | |
| 742.34 | 0.00 | 745.40 | 0.00 | 748.46 | 1.11 | | |
| 742.40 | 0.00 | 745.46 | 0.00 | 748.52 | 1.12 | | |
| 742.46 | 0.00 | 745.52 | 0.00 | 748.58 | 1.14 | | |
| 742.52 | 0.00 | 745.58 | 0.00 | 748.64 | 1.15 | | |
| 742.58 | 0.00 | 745.64 | 0.00 | 748.70 | 1.27 | | |
| 742.64 | 0.00 | 745.70 | 0.00 | 748.76 | 1.54 | | |
| 742.70 | 0.00 | 745.76 | 0.00 | 748.82 | 1.95 | | |
| 742.76 | 0.00 | 745.82 | 0.00 | 748.88 | 2.51 | | |
| 742.82 | 0.00 | 745.88 | 0.00 | 748.94 | 3.21 | | |
| 742.88 | 0.00 | 745.94 | 0.00 | 749.00 | 4.07 | | |
| 742.94 | 0.00 | 746.00 | 0.00 | 749.06 | 5.12 | | |
| 743.00 | 0.00 | 746.06 | 0.01 | 749.12 | 6.46 | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Stage-Area-Storage for Pond P-1: Wet Pond P-1

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---------------------|-------------------------|---------------------|-------------------------|
| 740.00 | 0 | 747.65 | 22,616 |
| 740.15 | 0 | 747.80 | 25,249 |
| 740.30 | 0 | 747.95 | 28,010 |
| 740.45 | 0 | 748.10 | 30,929 |
| 740.60 | 0 | 748.25 | 34,112 |
| 740.75 | 0 | 748.40 | 37,575 |
| 740.90 | 0 | 748.55 | 41,333 |
| 741.05 | 0 | 748.70 | 45,396 |
| 741.20 | 0 | 748.85 | 49,777 |
| 741.35 | 0 | 749.00 | 54,488 |
| 741.50 | 0 | 749.15 | 59,442 |
| 741.65 | 0 | 749.30 | 64,548 |
| 741.80 | 0 | 749.45 | 69,809 |
| 741.95 | 0 | 749.60 | 75,227 |
| 742.10 | 0 | 749.75 | 80,803 |
| 742.25 | 0 | 749.90 | 86,540 |
| 742.40 | 0 | 750.05 | 92,440 |
| 742.55 | 0 | 750.20 | 98,497 |
| 742.70 | 0 | 750.35 | 104,710 |
| 742.85 | 0 | 750.50 | 111,081 |
| 743.00 | 0 | 750.65 | 117,612 |
| 743.15 | 0 | 750.80 | 124,305 |
| 743.30 | 0 | 750.95 | 131,161 |
| 743.45 | 0 | | |
| 743.60 | 0 | | |
| 743.75 | 0 | | |
| 743.90 | 0 | | |
| 744.05 | 0 | | |
| 744.20 | 0 | | |
| 744.35 | 0 | | |
| 744.50 | 0 | | |
| 744.65 | 0 | | |
| 744.80 | 0 | | |
| 744.95 | 0 | | |
| 745.10 | 0 | | |
| 745.25 | 0 | | |
| 745.40 | 0 | | |
| 745.55 | 0 | | |
| 745.70 | 0 | | |
| 745.85 | 0 | | |
| 746.00 | 0 | | |
| 746.15 | 1,744 | | |
| 746.30 | 3,537 | | |
| 746.45 | 5,382 | | |
| 746.60 | 7,278 | | |
| 746.75 | 9,227 | | |
| 746.90 | 11,228 | | |
| 747.05 | 13,286 | | |
| 747.20 | 15,444 | | |
| 747.35 | 17,716 | | |
| 747.50 | 20,105 | | |

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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link 1AT: DA #1A Total

Inflow Area = 56.205 ac, 63.22% Impervious, Inflow Depth = 0.92" for 1-yr event
Inflow = 24.42 cfs @ 12.26 hrs, Volume= 4.321 af
Primary = 24.42 cfs @ 12.26 hrs, Volume= 4.321 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link DP-1: DP #1 - Rush Crk Trib.

Inflow Area = 56.205 ac, 63.22% Impervious, Inflow Depth = 0.92" for 1-yr event
Inflow = 24.42 cfs @ 12.26 hrs, Volume= 4.321 af
Primary = 24.42 cfs @ 12.26 hrs, Volume= 4.321 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link DP-2: DP #2 - Smokes Crk

Inflow Area = 83.814 ac, 88.53% Impervious, Inflow Depth = 1.42" for 1-yr event
Inflow = 101.88 cfs @ 12.00 hrs, Volume= 9.921 af
Primary = 101.88 cfs @ 12.00 hrs, Volume= 9.921 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

1-yr Primary Outflow Imported from Proposed Conditions II~Link DP-2.hce

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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link DP-3: DP #3 - Rush Crk

Inflow Area = 55.981 ac, 45.79% Impervious, Inflow Depth > 0.82" for 1-yr event
Inflow = 21.61 cfs @ 12.36 hrs, Volume= 3.817 af
Primary = 21.61 cfs @ 12.36 hrs, Volume= 3.817 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

1-yr Primary Outflow Imported from Proposed Conditions III~Link DP-3.hce

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Proposed Conditions - I
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link PT: Proposed Conditions Total Offsite

Inflow Area = 196.000 ac, 69.06% Impervious, Inflow Depth > 1.11" for 1-yr event
Inflow = 125.79 cfs @ 12.18 hrs, Volume= 18.060 af
Primary = 125.79 cfs @ 12.18 hrs, Volume= 18.060 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Subcatchment 1A-I: DA #1A-I

Runoff = 43.22 cfs @ 12.27 hrs, Volume= 4.419 af, Depth= 2.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 11.558 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 13.442 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 1.044 | 77 | Woods, Good, HSG D |
| 26.044 | 89 | Weighted Average |
| 12.602 | | 48.39% Pervious Area |
| 13.442 | | 51.61% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 26.7 | 150 | 0.0150 | 0.09 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 2.9 | 340 | 0.0150 | 1.97 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 0.4 | 75 | 0.0200 | 2.87 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.8 | 760 | | 4.50 | | Direct Entry, Pipe Flow |
| 32.8 | 1,325 | Total | | | |

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Subcatchment 1A-II: DA #1A-II

Runoff = 38.25 cfs @ 11.97 hrs, Volume= 1.942 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 2.746 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 6.783 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.587 | 77 | Woods, Good, HSG D |
| 10.116 | 92 | Weighted Average |
| 3.333 | | 32.95% Pervious Area |
| 6.783 | | 67.05% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.6 | 100 | 0.0170 | 1.07 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 0.9 | 140 | 0.0170 | 2.65 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.3 | 630 | | 4.50 | | Direct Entry, Pipe Flow |
| 4.8 | 870 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Subcatchment 1A-III: DA #1A-III

Runoff = 22.14 cfs @ 11.96 hrs, Volume= 1.169 af, Depth= 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.883 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 4.519 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 5.402 | 95 | Weighted Average |
| 0.883 | | 16.35% Pervious Area |
| 4.519 | | 83.65% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.6 | 100 | 0.0170 | 1.07 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 1.3 | 205 | 0.0170 | 2.65 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.9 | 305 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Subcatchment 1A-IV: DA #1A-IV

Runoff = 25.52 cfs @ 11.97 hrs, Volume= 1.296 af, Depth= 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 2.082 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 4.668 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 6.750 | 92 | Weighted Average |
| 2.082 | | 30.84% Pervious Area |
| 4.668 | | 69.16% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|--|-------------------|----------------|--|
| 1.6 | 100 | 0.0170 | 1.07 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 0.7 | 110 | 0.0170 | 2.65 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.4 | 360 | | 2.50 | | Direct Entry, |
| 4.7 | 570 | Total, Increased to minimum Tc = 6.0 min | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Subcatchment 1A-V: DA #1A-V

Runoff = 21.28 cfs @ 11.96 hrs, Volume= 1.106 af, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 1.233 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 4.088 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 5.321 | 94 | Weighted Average |
| 1.233 | | 23.17% Pervious Area |
| 4.088 | | 76.83% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.6 | 100 | 0.0170 | 1.07 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 1.4 | 225 | 0.0170 | 2.65 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 1.3 | 200 | | 2.50 | | Direct Entry, Swale Flow |
| 4.3 | 525 | | | | Total, Increased to minimum Tc = 6.0 min |

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Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Subcatchment 1A-VI: DA #1A-V

Runoff = 10.29 cfs @ 11.96 hrs, Volume= 0.535 af, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.542 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 2.030 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 2.572 | 94 | Weighted Average |
| 0.542 | | 21.07% Pervious Area |
| 2.030 | | 78.93% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.5 | 100 | 0.0200 | 1.14 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 2.0 | 350 | 0.0200 | 2.87 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 1.3 | 200 | | 2.50 | | Direct Entry, Swale Flow |
| 4.8 | 650 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Pond B-1: Bioretention B-1

Inflow Area = 5.402 ac, 83.65% Impervious, Inflow Depth = 2.60" for 10-yr event
Inflow = 22.14 cfs @ 11.96 hrs, Volume= 1.169 af
Outflow = 11.95 cfs @ 12.05 hrs, Volume= 1.013 af, Atten= 46%, Lag= 5.0 min
Primary = 7.99 cfs @ 11.97 hrs, Volume= 0.934 af
Secondary = 4.57 cfs @ 12.06 hrs, Volume= 0.079 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 750.56' @ 12.06 hrs Surf.Area= 15,038 sf Storage= 18,536 cf

Plug-Flow detention time= 123.8 min calculated for 1.012 af (87% of inflow)
Center-of-Mass det. time= 61.7 min (839.8 - 778.1)

| Volume | Invert | Avail.Storage | Storage Description |
|------------------|-------------------|------------------------|--|
| #1 | 749.25' | 29,200 cf | Surf. Storage (Prismatic) Listed below (Recalc) |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 749.25 | 13,200 | 0 | 0 |
| 751.25 | 16,000 | 29,200 | 29,200 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|---|
| #1 | Primary | 747.25' | 15.0" Round Culvert-Primary L= 87.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 747.25' / 747.00' S= 0.0029 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf |
| #2 | Device 1 | 749.75' | 24.0" x 24.0" Horiz. Grate-Primary C= 0.600 Limited to weir flow at low heads |
| #3 | Primary | 751.00' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |
| #4 | Secondary | 745.75' | 15.0" Round Culvert-Secondary L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 745.75' / 744.13' S= 0.0360 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf |
| #5 | Device 4 | 750.25' | 24.0" x 24.0" Horiz. Grate-Secondary C= 0.600 Limited to weir flow at low heads |

Primary OutFlow Max=7.52 cfs @ 11.97 hrs HW=750.42' TW=748.54' (Dynamic Tailwater)

- 1=Culvert-Primary (Outlet Controls 7.52 cfs @ 6.13 fps)
- 2=Grate-Primary (Passes 7.52 cfs of 14.33 cfs potential flow)
- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Secondary OutFlow Max=4.41 cfs @ 12.06 hrs HW=750.56' TW=0.00' (Dynamic Tailwater)

- 4=Culvert-Secondary (Passes 4.41 cfs of 12.08 cfs potential flow)
- 5=Grate-Secondary (Weir Controls 4.41 cfs @ 1.81 fps)

Proposed Conditions I

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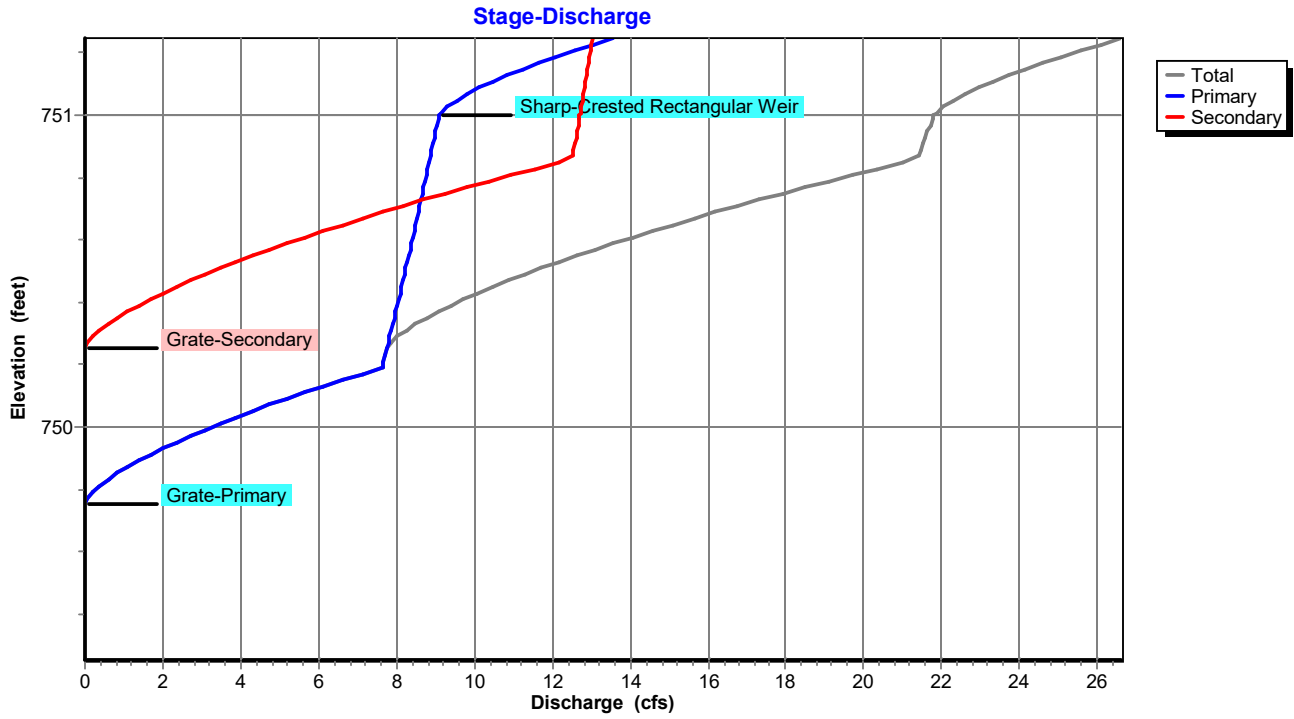
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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

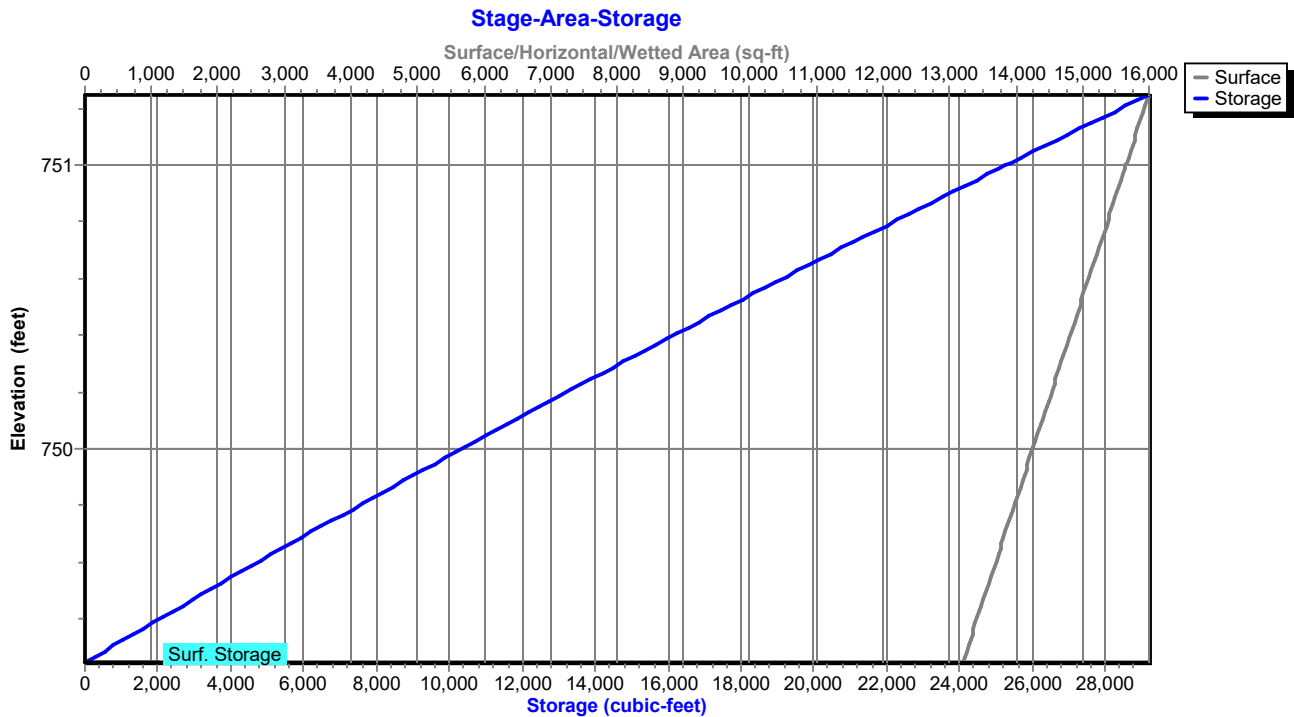
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Pond B-1: Bioretention B-1



Pond B-1: Bioretention B-1



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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Stage-Discharge for Pond B-1: Bioretention B-1

| Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) | Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) |
|---------------------|--------------------|------------------|--------------------|---------------------|--------------------|------------------|--------------------|
| 749.25 | 0.00 | 0.00 | 0.00 | 750.27 | 7.86 | 7.79 | 0.07 |
| 749.27 | 0.00 | 0.00 | 0.00 | 750.29 | 8.04 | 7.83 | 0.21 |
| 749.29 | 0.00 | 0.00 | 0.00 | 750.31 | 8.25 | 7.87 | 0.38 |
| 749.31 | 0.00 | 0.00 | 0.00 | 750.33 | 8.50 | 7.90 | 0.59 |
| 749.33 | 0.00 | 0.00 | 0.00 | 750.35 | 8.77 | 7.94 | 0.83 |
| 749.35 | 0.00 | 0.00 | 0.00 | 750.37 | 9.07 | 7.98 | 1.09 |
| 749.37 | 0.00 | 0.00 | 0.00 | 750.39 | 9.39 | 8.02 | 1.37 |
| 749.39 | 0.00 | 0.00 | 0.00 | 750.41 | 9.73 | 8.06 | 1.67 |
| 749.41 | 0.00 | 0.00 | 0.00 | 750.43 | 10.09 | 8.09 | 2.00 |
| 749.43 | 0.00 | 0.00 | 0.00 | 750.45 | 10.47 | 8.13 | 2.34 |
| 749.45 | 0.00 | 0.00 | 0.00 | 750.47 | 10.87 | 8.17 | 2.70 |
| 749.47 | 0.00 | 0.00 | 0.00 | 750.49 | 11.28 | 8.20 | 3.08 |
| 749.49 | 0.00 | 0.00 | 0.00 | 750.51 | 11.71 | 8.24 | 3.47 |
| 749.51 | 0.00 | 0.00 | 0.00 | 750.53 | 12.15 | 8.28 | 3.88 |
| 749.53 | 0.00 | 0.00 | 0.00 | 750.55 | 12.61 | 8.31 | 4.30 |
| 749.55 | 0.00 | 0.00 | 0.00 | 750.57 | 13.08 | 8.35 | 4.74 |
| 749.57 | 0.00 | 0.00 | 0.00 | 750.59 | 13.57 | 8.38 | 5.19 |
| 749.59 | 0.00 | 0.00 | 0.00 | 750.61 | 14.07 | 8.42 | 5.65 |
| 749.61 | 0.00 | 0.00 | 0.00 | 750.63 | 14.58 | 8.46 | 6.13 |
| 749.63 | 0.00 | 0.00 | 0.00 | 750.65 | 15.11 | 8.49 | 6.62 |
| 749.65 | 0.00 | 0.00 | 0.00 | 750.67 | 15.65 | 8.53 | 7.12 |
| 749.67 | 0.00 | 0.00 | 0.00 | 750.69 | 16.20 | 8.56 | 7.64 |
| 749.69 | 0.00 | 0.00 | 0.00 | 750.71 | 16.76 | 8.60 | 8.16 |
| 749.71 | 0.00 | 0.00 | 0.00 | 750.73 | 17.33 | 8.63 | 8.70 |
| 749.73 | 0.00 | 0.00 | 0.00 | 750.75 | 17.91 | 8.67 | 9.25 |
| 749.75 | 0.00 | 0.00 | 0.00 | 750.77 | 18.51 | 8.70 | 9.81 |
| 749.77 | 0.07 | 0.07 | 0.00 | 750.79 | 19.12 | 8.73 | 10.38 |
| 749.79 | 0.21 | 0.21 | 0.00 | 750.81 | 19.73 | 8.77 | 10.96 |
| 749.81 | 0.38 | 0.38 | 0.00 | 750.83 | 20.36 | 8.80 | 11.56 |
| 749.83 | 0.59 | 0.59 | 0.00 | 750.85 | 21.00 | 8.84 | 12.16 |
| 749.85 | 0.83 | 0.83 | 0.00 | 750.87 | 21.40 | 8.87 | 12.53 |
| 749.87 | 1.09 | 1.09 | 0.00 | 750.89 | 21.46 | 8.91 | 12.56 |
| 749.89 | 1.37 | 1.37 | 0.00 | 750.91 | 21.52 | 8.94 | 12.58 |
| 749.91 | 1.67 | 1.67 | 0.00 | 750.93 | 21.58 | 8.97 | 12.61 |
| 749.93 | 2.00 | 2.00 | 0.00 | 750.95 | 21.64 | 9.01 | 12.64 |
| 749.95 | 2.34 | 2.34 | 0.00 | 750.97 | 21.71 | 9.04 | 12.67 |
| 749.97 | 2.70 | 2.70 | 0.00 | 750.99 | 21.77 | 9.07 | 12.69 |
| 749.99 | 3.08 | 3.08 | 0.00 | 751.01 | 21.86 | 9.14 | 12.72 |
| 750.01 | 3.47 | 3.47 | 0.00 | 751.03 | 22.06 | 9.31 | 12.75 |
| 750.03 | 3.88 | 3.88 | 0.00 | 751.05 | 22.31 | 9.54 | 12.78 |
| 750.05 | 4.30 | 4.30 | 0.00 | 751.07 | 22.61 | 9.81 | 12.80 |
| 750.07 | 4.74 | 4.74 | 0.00 | 751.09 | 22.95 | 10.12 | 12.83 |
| 750.09 | 5.19 | 5.19 | 0.00 | 751.11 | 23.32 | 10.46 | 12.86 |
| 750.11 | 5.65 | 5.65 | 0.00 | 751.13 | 23.71 | 10.83 | 12.88 |
| 750.13 | 6.13 | 6.13 | 0.00 | 751.15 | 24.14 | 11.23 | 12.91 |
| 750.15 | 6.62 | 6.62 | 0.00 | 751.17 | 24.59 | 11.65 | 12.94 |
| 750.17 | 7.12 | 7.12 | 0.00 | 751.19 | 25.06 | 12.10 | 12.97 |
| 750.19 | 7.63 | 7.63 | 0.00 | 751.21 | 25.56 | 12.56 | 12.99 |
| 750.21 | 7.67 | 7.67 | 0.00 | 751.23 | 26.07 | 13.05 | 13.02 |
| 750.23 | 7.71 | 7.71 | 0.00 | 751.25 | 26.61 | 13.56 | 13.05 |
| 750.25 | 7.75 | 7.75 | 0.00 | | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Stage-Area-Storage for Pond B-1: Bioretention B-1

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 749.25 | 13,200 | 0 | 750.27 | 14,628 | 14,192 |
| 749.27 | 13,228 | 264 | 750.29 | 14,656 | 14,485 |
| 749.29 | 13,256 | 529 | 750.31 | 14,684 | 14,779 |
| 749.31 | 13,284 | 795 | 750.33 | 14,712 | 15,072 |
| 749.33 | 13,312 | 1,060 | 750.35 | 14,740 | 15,367 |
| 749.35 | 13,340 | 1,327 | 750.37 | 14,768 | 15,662 |
| 749.37 | 13,368 | 1,594 | 750.39 | 14,796 | 15,958 |
| 749.39 | 13,396 | 1,862 | 750.41 | 14,824 | 16,254 |
| 749.41 | 13,424 | 2,130 | 750.43 | 14,852 | 16,551 |
| 749.43 | 13,452 | 2,399 | 750.45 | 14,880 | 16,848 |
| 749.45 | 13,480 | 2,668 | 750.47 | 14,908 | 17,146 |
| 749.47 | 13,508 | 2,938 | 750.49 | 14,936 | 17,444 |
| 749.49 | 13,536 | 3,208 | 750.51 | 14,964 | 17,743 |
| 749.51 | 13,564 | 3,479 | 750.53 | 14,992 | 18,043 |
| 749.53 | 13,592 | 3,751 | 750.55 | 15,020 | 18,343 |
| 749.55 | 13,620 | 4,023 | 750.57 | 15,048 | 18,644 |
| 749.57 | 13,648 | 4,296 | 750.59 | 15,076 | 18,945 |
| 749.59 | 13,676 | 4,569 | 750.61 | 15,104 | 19,247 |
| 749.61 | 13,704 | 4,843 | 750.63 | 15,132 | 19,549 |
| 749.63 | 13,732 | 5,117 | 750.65 | 15,160 | 19,852 |
| 749.65 | 13,760 | 5,392 | 750.67 | 15,188 | 20,155 |
| 749.67 | 13,788 | 5,667 | 750.69 | 15,216 | 20,460 |
| 749.69 | 13,816 | 5,944 | 750.71 | 15,244 | 20,764 |
| 749.71 | 13,844 | 6,220 | 750.73 | 15,272 | 21,069 |
| 749.73 | 13,872 | 6,497 | 750.75 | 15,300 | 21,375 |
| 749.75 | 13,900 | 6,775 | 750.77 | 15,328 | 21,681 |
| 749.77 | 13,928 | 7,053 | 750.79 | 15,356 | 21,988 |
| 749.79 | 13,956 | 7,332 | 750.81 | 15,384 | 22,296 |
| 749.81 | 13,984 | 7,612 | 750.83 | 15,412 | 22,603 |
| 749.83 | 14,012 | 7,891 | 750.85 | 15,440 | 22,912 |
| 749.85 | 14,040 | 8,172 | 750.87 | 15,468 | 23,221 |
| 749.87 | 14,068 | 8,453 | 750.89 | 15,496 | 23,531 |
| 749.89 | 14,096 | 8,735 | 750.91 | 15,524 | 23,841 |
| 749.91 | 14,124 | 9,017 | 750.93 | 15,552 | 24,152 |
| 749.93 | 14,152 | 9,300 | 750.95 | 15,580 | 24,463 |
| 749.95 | 14,180 | 9,583 | 750.97 | 15,608 | 24,775 |
| 749.97 | 14,208 | 9,867 | 750.99 | 15,636 | 25,087 |
| 749.99 | 14,236 | 10,151 | 751.01 | 15,664 | 25,400 |
| 750.01 | 14,264 | 10,436 | 751.03 | 15,692 | 25,714 |
| 750.03 | 14,292 | 10,722 | 751.05 | 15,720 | 26,028 |
| 750.05 | 14,320 | 11,008 | 751.07 | 15,748 | 26,343 |
| 750.07 | 14,348 | 11,295 | 751.09 | 15,776 | 26,658 |
| 750.09 | 14,376 | 11,582 | 751.11 | 15,804 | 26,974 |
| 750.11 | 14,404 | 11,870 | 751.13 | 15,832 | 27,290 |
| 750.13 | 14,432 | 12,158 | 751.15 | 15,860 | 27,607 |
| 750.15 | 14,460 | 12,447 | 751.17 | 15,888 | 27,924 |
| 750.17 | 14,488 | 12,736 | 751.19 | 15,916 | 28,243 |
| 750.19 | 14,516 | 13,027 | 751.21 | 15,944 | 28,561 |
| 750.21 | 14,544 | 13,317 | 751.23 | 15,972 | 28,880 |
| 750.23 | 14,572 | 13,608 | 751.25 | 16,000 | 29,200 |
| 750.25 | 14,600 | 13,900 | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Pond B-2: Bioretention B-2

Inflow Area = 6.750 ac, 69.16% Impervious, Inflow Depth = 2.30" for 10-yr event
 Inflow = 25.52 cfs @ 11.97 hrs, Volume= 1.296 af
 Outflow = 4.85 cfs @ 12.12 hrs, Volume= 1.102 af, Atten= 81%, Lag= 9.3 min
 Primary = 4.61 cfs @ 11.98 hrs, Volume= 1.082 af
 Secondary = 0.79 cfs @ 12.16 hrs, Volume= 0.020 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Peak Elev= 750.85' @ 12.16 hrs Surf.Area= 25,099 sf Storage= 26,999 cf

Plug-Flow detention time= 152.7 min calculated for 1.102 af (85% of inflow)
 Center-of-Mass det. time= 84.3 min (879.5 - 795.2)

| Volume | Invert | Avail.Storage | Storage Description |
|------------------|-------------------|------------------------|--|
| #1 | 749.50' | 45,000 cf | Surf. Storage (Prismatic) Listed below (Recalc) |
| | | | |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 749.50 | 15,000 | 0 | 0 |
| 751.50 | 30,000 | 45,000 | 45,000 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|--|
| #1 | Primary | 747.50' | 12.0" Round Culvert-Primary L= 105.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 747.50' / 747.25' S= 0.0024 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf |
| #2 | Device 1 | 750.00' | 24.0" x 24.0" Horiz. Grate-Primary C= 0.600 Limited to weir flow at low heads |
| #3 | Secondary | 746.00' | 12.0" Round Culvert-Secondary L= 130.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 746.00' / 738.10' S= 0.0608 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf |
| #4 | Device 3 | 750.75' | 24.0" x 24.0" Horiz. Grate-Secondary C= 0.600 Limited to weir flow at low heads |
| #5 | Primary | 751.00' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=4.33 cfs @ 11.98 hrs HW=750.61' TW=748.57' (Dynamic Tailwater)

- ↑ 1=Culvert-Primary (Outlet Controls 4.33 cfs @ 5.51 fps)
- ↑ 2=Grate-Primary (Passes 4.33 cfs of 12.32 cfs potential flow)
- ↑ 5=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Secondary OutFlow Max=0.77 cfs @ 12.16 hrs HW=750.85' TW=0.00' (Dynamic Tailwater)

- ↑ 3=Culvert-Secondary (Passes 0.77 cfs of 7.88 cfs potential flow)
- ↑ 4=Grate-Secondary (Weir Controls 0.77 cfs @ 1.01 fps)

Proposed Conditions I

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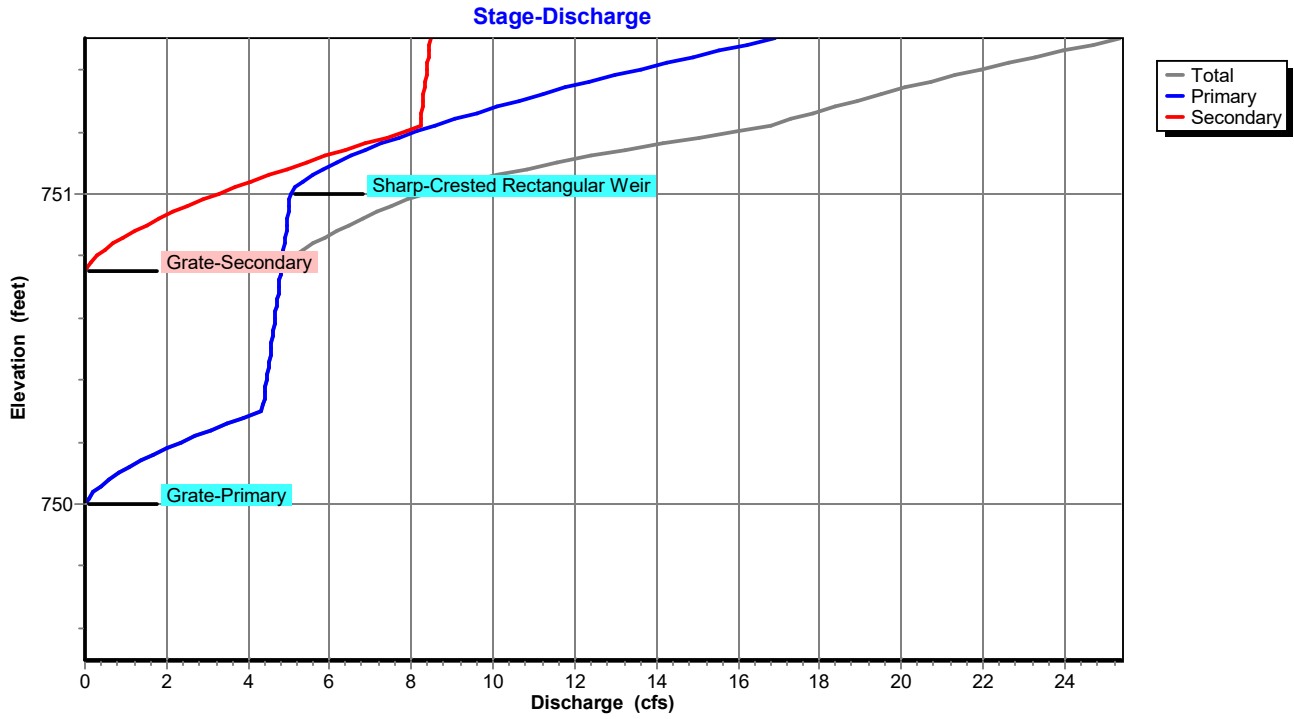
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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

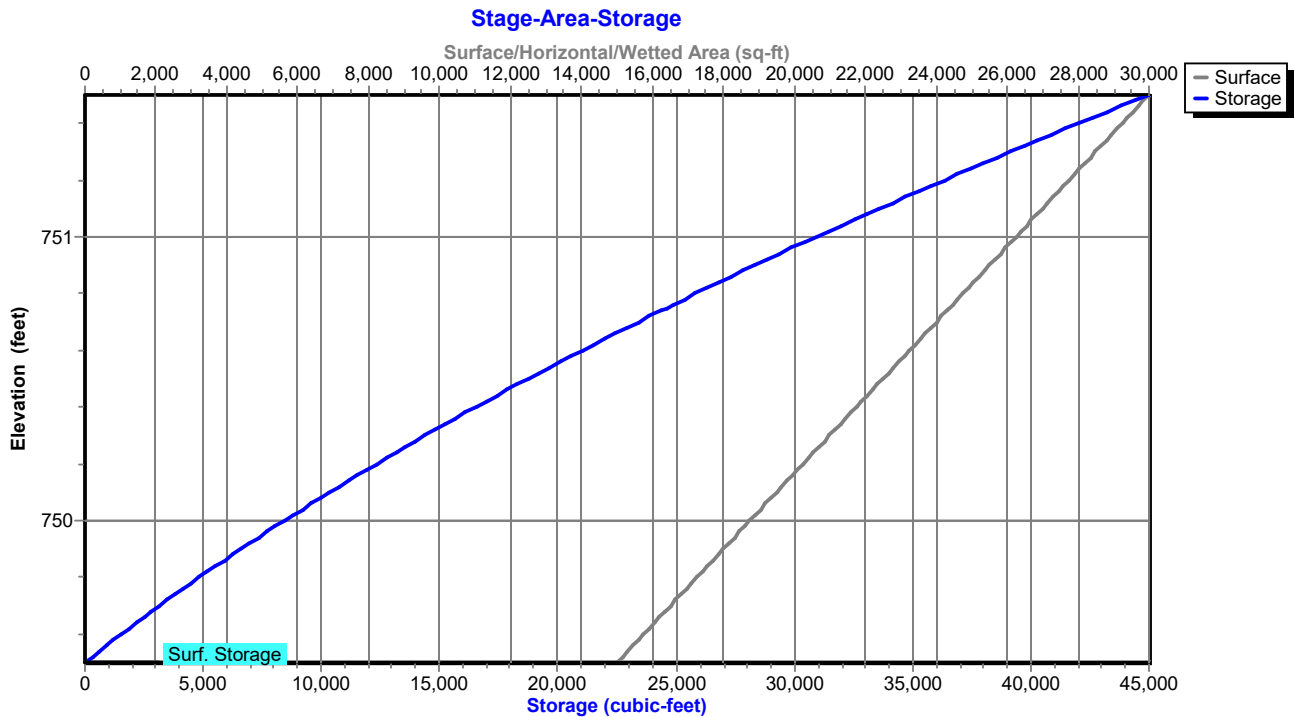
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Pond B-2: Bioretention B-2



Pond B-2: Bioretention B-2



Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Stage-Discharge for Pond B-2: Bioretention B-2

| Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) | Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) |
|---------------------|--------------------|------------------|--------------------|---------------------|--------------------|------------------|--------------------|
| 749.50 | 0.00 | 0.00 | 0.00 | 750.52 | 4.57 | 4.57 | 0.00 |
| 749.52 | 0.00 | 0.00 | 0.00 | 750.54 | 4.59 | 4.59 | 0.00 |
| 749.54 | 0.00 | 0.00 | 0.00 | 750.56 | 4.61 | 4.61 | 0.00 |
| 749.56 | 0.00 | 0.00 | 0.00 | 750.58 | 4.63 | 4.63 | 0.00 |
| 749.58 | 0.00 | 0.00 | 0.00 | 750.60 | 4.65 | 4.65 | 0.00 |
| 749.60 | 0.00 | 0.00 | 0.00 | 750.62 | 4.67 | 4.67 | 0.00 |
| 749.62 | 0.00 | 0.00 | 0.00 | 750.64 | 4.69 | 4.69 | 0.00 |
| 749.64 | 0.00 | 0.00 | 0.00 | 750.66 | 4.71 | 4.71 | 0.00 |
| 749.66 | 0.00 | 0.00 | 0.00 | 750.68 | 4.73 | 4.73 | 0.00 |
| 749.68 | 0.00 | 0.00 | 0.00 | 750.70 | 4.75 | 4.75 | 0.00 |
| 749.70 | 0.00 | 0.00 | 0.00 | 750.72 | 4.77 | 4.77 | 0.00 |
| 749.72 | 0.00 | 0.00 | 0.00 | 750.74 | 4.79 | 4.79 | 0.00 |
| 749.74 | 0.00 | 0.00 | 0.00 | 750.76 | 4.84 | 4.81 | 0.03 |
| 749.76 | 0.00 | 0.00 | 0.00 | 750.78 | 4.97 | 4.83 | 0.14 |
| 749.78 | 0.00 | 0.00 | 0.00 | 750.80 | 5.14 | 4.85 | 0.29 |
| 749.80 | 0.00 | 0.00 | 0.00 | 750.82 | 5.35 | 4.87 | 0.48 |
| 749.82 | 0.00 | 0.00 | 0.00 | 750.84 | 5.59 | 4.89 | 0.71 |
| 749.84 | 0.00 | 0.00 | 0.00 | 750.86 | 5.86 | 4.91 | 0.95 |
| 749.86 | 0.00 | 0.00 | 0.00 | 750.88 | 6.15 | 4.92 | 1.23 |
| 749.88 | 0.00 | 0.00 | 0.00 | 750.90 | 6.46 | 4.94 | 1.52 |
| 749.90 | 0.00 | 0.00 | 0.00 | 750.92 | 6.79 | 4.96 | 1.83 |
| 749.92 | 0.00 | 0.00 | 0.00 | 750.94 | 7.15 | 4.98 | 2.17 |
| 749.94 | 0.00 | 0.00 | 0.00 | 750.96 | 7.52 | 5.00 | 2.52 |
| 749.96 | 0.00 | 0.00 | 0.00 | 750.98 | 7.90 | 5.02 | 2.89 |
| 749.98 | 0.00 | 0.00 | 0.00 | 751.00 | 8.31 | 5.04 | 3.27 |
| 750.00 | 0.00 | 0.00 | 0.00 | 751.02 | 8.82 | 5.15 | 3.67 |
| 750.02 | 0.07 | 0.07 | 0.00 | 751.04 | 9.42 | 5.33 | 4.09 |
| 750.04 | 0.21 | 0.21 | 0.00 | 751.06 | 10.08 | 5.57 | 4.52 |
| 750.06 | 0.38 | 0.38 | 0.00 | 751.08 | 10.81 | 5.85 | 4.96 |
| 750.08 | 0.59 | 0.59 | 0.00 | 751.10 | 11.57 | 6.16 | 5.42 |
| 750.10 | 0.83 | 0.83 | 0.00 | 751.12 | 12.39 | 6.50 | 5.89 |
| 750.12 | 1.09 | 1.09 | 0.00 | 751.14 | 13.24 | 6.87 | 6.37 |
| 750.14 | 1.37 | 1.37 | 0.00 | 751.16 | 14.13 | 7.27 | 6.87 |
| 750.16 | 1.67 | 1.67 | 0.00 | 751.18 | 15.06 | 7.69 | 7.38 |
| 750.18 | 2.00 | 2.00 | 0.00 | 751.20 | 16.02 | 8.13 | 7.90 |
| 750.20 | 2.34 | 2.34 | 0.00 | 751.22 | 16.81 | 8.59 | 8.22 |
| 750.22 | 2.70 | 2.70 | 0.00 | 751.24 | 17.31 | 9.08 | 8.23 |
| 750.24 | 3.08 | 3.08 | 0.00 | 751.26 | 17.83 | 9.58 | 8.25 |
| 750.26 | 3.47 | 3.47 | 0.00 | 751.28 | 18.37 | 10.10 | 8.27 |
| 750.28 | 3.88 | 3.88 | 0.00 | 751.30 | 18.93 | 10.64 | 8.29 |
| 750.30 | 4.30 | 4.30 | 0.00 | 751.32 | 19.50 | 11.20 | 8.30 |
| 750.32 | 4.37 | 4.37 | 0.00 | 751.34 | 20.10 | 11.78 | 8.32 |
| 750.34 | 4.39 | 4.39 | 0.00 | 751.36 | 20.70 | 12.37 | 8.34 |
| 750.36 | 4.41 | 4.41 | 0.00 | 751.38 | 21.33 | 12.97 | 8.35 |
| 750.38 | 4.43 | 4.43 | 0.00 | 751.40 | 21.97 | 13.60 | 8.37 |
| 750.40 | 4.45 | 4.45 | 0.00 | 751.42 | 22.62 | 14.23 | 8.39 |
| 750.42 | 4.47 | 4.47 | 0.00 | 751.44 | 23.29 | 14.88 | 8.41 |
| 750.44 | 4.49 | 4.49 | 0.00 | 751.46 | 23.97 | 15.55 | 8.42 |
| 750.46 | 4.51 | 4.51 | 0.00 | 751.48 | 24.67 | 16.23 | 8.44 |
| 750.48 | 4.53 | 4.53 | 0.00 | 751.50 | 25.38 | 16.92 | 8.46 |
| 750.50 | 4.55 | 4.55 | 0.00 | | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Stage-Area-Storage for Pond B-2: Bioretention B-2

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 749.50 | 15,000 | 0 | 750.52 | 22,650 | 19,201 |
| 749.52 | 15,150 | 301 | 750.54 | 22,800 | 19,656 |
| 749.54 | 15,300 | 606 | 750.56 | 22,950 | 20,113 |
| 749.56 | 15,450 | 913 | 750.58 | 23,100 | 20,574 |
| 749.58 | 15,600 | 1,224 | 750.60 | 23,250 | 21,038 |
| 749.60 | 15,750 | 1,538 | 750.62 | 23,400 | 21,504 |
| 749.62 | 15,900 | 1,854 | 750.64 | 23,550 | 21,973 |
| 749.64 | 16,050 | 2,173 | 750.66 | 23,700 | 22,446 |
| 749.66 | 16,200 | 2,496 | 750.68 | 23,850 | 22,921 |
| 749.68 | 16,350 | 2,821 | 750.70 | 24,000 | 23,400 |
| 749.70 | 16,500 | 3,150 | 750.72 | 24,150 | 23,882 |
| 749.72 | 16,650 | 3,482 | 750.74 | 24,300 | 24,366 |
| 749.74 | 16,800 | 3,816 | 750.76 | 24,450 | 24,853 |
| 749.76 | 16,950 | 4,153 | 750.78 | 24,600 | 25,344 |
| 749.78 | 17,100 | 4,494 | 750.80 | 24,750 | 25,837 |
| 749.80 | 17,250 | 4,837 | 750.82 | 24,900 | 26,334 |
| 749.82 | 17,400 | 5,184 | 750.84 | 25,050 | 26,834 |
| 749.84 | 17,550 | 5,534 | 750.86 | 25,200 | 27,336 |
| 749.86 | 17,700 | 5,886 | 750.88 | 25,350 | 27,841 |
| 749.88 | 17,850 | 6,241 | 750.90 | 25,500 | 28,350 |
| 749.90 | 18,000 | 6,600 | 750.92 | 25,650 | 28,861 |
| 749.92 | 18,150 | 6,961 | 750.94 | 25,800 | 29,376 |
| 749.94 | 18,300 | 7,326 | 750.96 | 25,950 | 29,894 |
| 749.96 | 18,450 | 7,694 | 750.98 | 26,100 | 30,414 |
| 749.98 | 18,600 | 8,064 | 751.00 | 26,250 | 30,938 |
| 750.00 | 18,750 | 8,438 | 751.02 | 26,400 | 31,464 |
| 750.02 | 18,900 | 8,814 | 751.04 | 26,550 | 31,993 |
| 750.04 | 19,050 | 9,193 | 751.06 | 26,700 | 32,526 |
| 750.06 | 19,200 | 9,576 | 751.08 | 26,850 | 33,062 |
| 750.08 | 19,350 | 9,962 | 751.10 | 27,000 | 33,600 |
| 750.10 | 19,500 | 10,350 | 751.12 | 27,150 | 34,142 |
| 750.12 | 19,650 | 10,742 | 751.14 | 27,300 | 34,686 |
| 750.14 | 19,800 | 11,136 | 751.16 | 27,450 | 35,233 |
| 750.16 | 19,950 | 11,533 | 751.18 | 27,600 | 35,784 |
| 750.18 | 20,100 | 11,934 | 751.20 | 27,750 | 36,338 |
| 750.20 | 20,250 | 12,338 | 751.22 | 27,900 | 36,894 |
| 750.22 | 20,400 | 12,744 | 751.24 | 28,050 | 37,454 |
| 750.24 | 20,550 | 13,154 | 751.26 | 28,200 | 38,016 |
| 750.26 | 20,700 | 13,566 | 751.28 | 28,350 | 38,581 |
| 750.28 | 20,850 | 13,981 | 751.30 | 28,500 | 39,150 |
| 750.30 | 21,000 | 14,400 | 751.32 | 28,650 | 39,722 |
| 750.32 | 21,150 | 14,822 | 751.34 | 28,800 | 40,296 |
| 750.34 | 21,300 | 15,246 | 751.36 | 28,950 | 40,874 |
| 750.36 | 21,450 | 15,674 | 751.38 | 29,100 | 41,454 |
| 750.38 | 21,600 | 16,104 | 751.40 | 29,250 | 42,037 |
| 750.40 | 21,750 | 16,537 | 751.42 | 29,400 | 42,624 |
| 750.42 | 21,900 | 16,974 | 751.44 | 29,550 | 43,214 |
| 750.44 | 22,050 | 17,414 | 751.46 | 29,700 | 43,806 |
| 750.46 | 22,200 | 17,856 | 751.48 | 29,850 | 44,402 |
| 750.48 | 22,350 | 18,302 | 751.50 | 30,000 | 45,000 |
| 750.50 | 22,500 | 18,750 | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Pond B-3: Bioretention B-3

Inflow Area = 5.321 ac, 76.83% Impervious, Inflow Depth = 2.50" for 10-yr event
 Inflow = 21.28 cfs @ 11.96 hrs, Volume= 1.106 af
 Outflow = 3.60 cfs @ 12.17 hrs, Volume= 0.952 af, Atten= 83%, Lag= 12.4 min
 Primary = 3.60 cfs @ 12.17 hrs, Volume= 0.952 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Peak Elev= 751.43' @ 12.17 hrs Surf.Area= 20,593 sf Storage= 23,338 cf

Plug-Flow detention time= 147.8 min calculated for 0.952 af (86% of inflow)
 Center-of-Mass det. time= 82.3 min (866.7 - 784.4)

| Volume | Invert | Avail.Storage | Storage Description |
|---------------------|----------------------|---------------------------|--|
| #1 | 750.00' | 36,000 cf | Surf. Storage (Prismatic) Listed below (Recalc) |
| | | | |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 750.00 | 12,000 | 0 | 0 |
| 752.00 | 24,000 | 36,000 | 36,000 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|---------|--|
| #1 | Primary | 746.50' | 8.0" Round Culvert-Primary L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 746.50' / 746.00' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf |
| #2 | Device 1 | 750.50' | 24.0" x 24.0" Horiz. Grate-Primary C= 0.600 Limited to weir flow at low heads |
| #3 | Primary | 751.50' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=3.60 cfs @ 12.17 hrs HW=751.43' TW=0.00' (Dynamic Tailwater)

1=Culvert-Primary (Inlet Controls 3.60 cfs @ 10.32 fps)
 2=Grate-Primary (Passes 3.60 cfs of 18.58 cfs potential flow)
 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Proposed Conditions I

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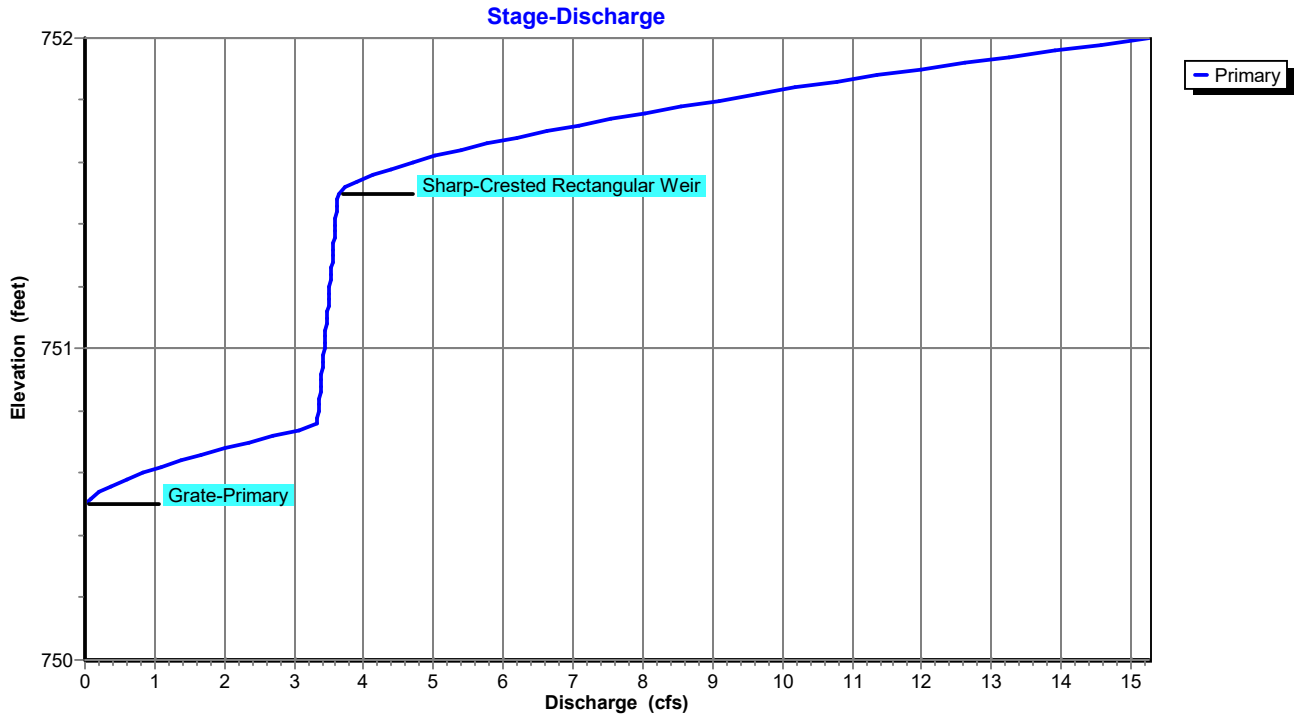
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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

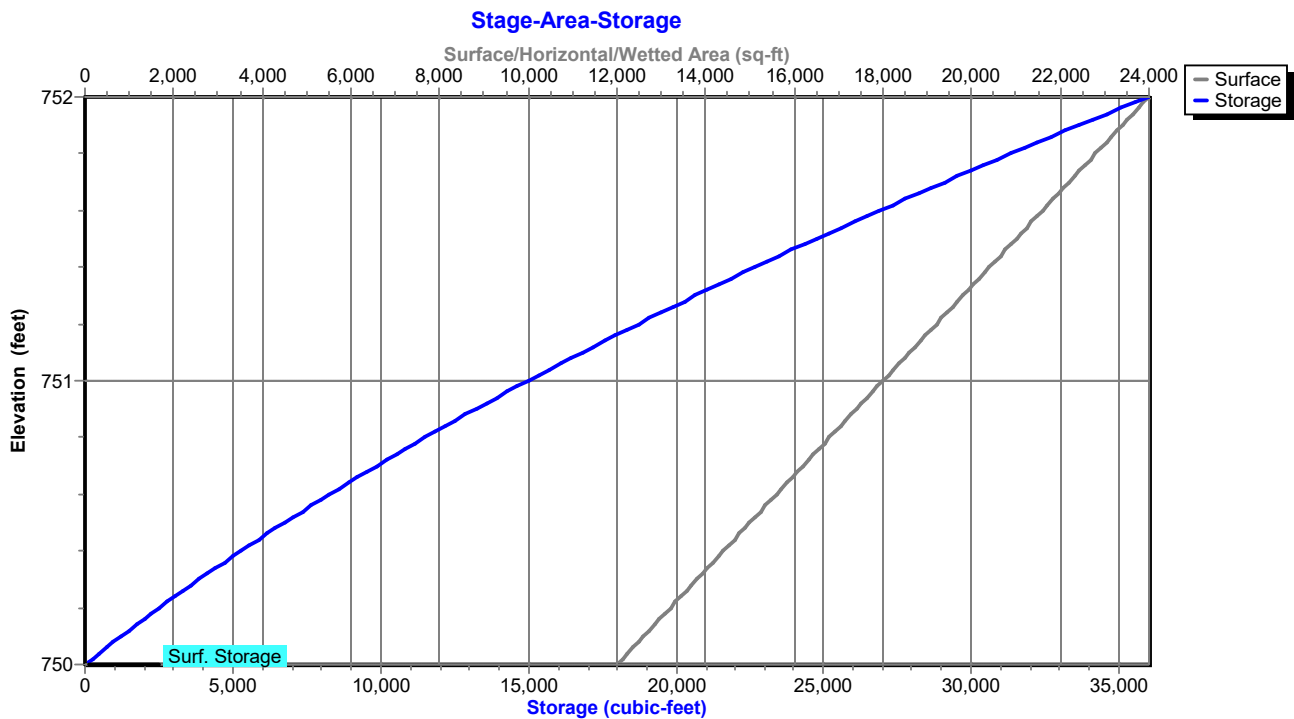
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Pond B-3: Bioretention B-3



Pond B-3: Bioretention B-3



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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Stage-Discharge for Pond B-3: Bioretention B-3

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|
| 750.00 | 0.00 | 750.51 | 0.03 | 751.02 | 3.44 | 751.53 | 3.81 |
| 750.01 | 0.00 | 750.52 | 0.07 | 751.03 | 3.44 | 751.54 | 3.91 |
| 750.02 | 0.00 | 750.53 | 0.14 | 751.04 | 3.45 | 751.55 | 4.01 |
| 750.03 | 0.00 | 750.54 | 0.21 | 751.05 | 3.45 | 751.56 | 4.13 |
| 750.04 | 0.00 | 750.55 | 0.29 | 751.06 | 3.46 | 751.57 | 4.26 |
| 750.05 | 0.00 | 750.56 | 0.38 | 751.07 | 3.46 | 751.58 | 4.40 |
| 750.06 | 0.00 | 750.57 | 0.48 | 751.08 | 3.46 | 751.59 | 4.55 |
| 750.07 | 0.00 | 750.58 | 0.59 | 751.09 | 3.47 | 751.60 | 4.70 |
| 750.08 | 0.00 | 750.59 | 0.71 | 751.10 | 3.47 | 751.61 | 4.86 |
| 750.09 | 0.00 | 750.60 | 0.83 | 751.11 | 3.48 | 751.62 | 5.03 |
| 750.10 | 0.00 | 750.61 | 0.95 | 751.12 | 3.48 | 751.63 | 5.21 |
| 750.11 | 0.00 | 750.62 | 1.09 | 751.13 | 3.48 | 751.64 | 5.39 |
| 750.12 | 0.00 | 750.63 | 1.23 | 751.14 | 3.49 | 751.65 | 5.58 |
| 750.13 | 0.00 | 750.64 | 1.37 | 751.15 | 3.49 | 751.66 | 5.78 |
| 750.14 | 0.00 | 750.65 | 1.52 | 751.16 | 3.50 | 751.67 | 5.98 |
| 750.15 | 0.00 | 750.66 | 1.67 | 751.17 | 3.50 | 751.68 | 6.19 |
| 750.16 | 0.00 | 750.67 | 1.83 | 751.18 | 3.50 | 751.69 | 6.40 |
| 750.17 | 0.00 | 750.68 | 2.00 | 751.19 | 3.51 | 751.70 | 6.62 |
| 750.18 | 0.00 | 750.69 | 2.17 | 751.20 | 3.51 | 751.71 | 6.84 |
| 750.19 | 0.00 | 750.70 | 2.34 | 751.21 | 3.52 | 751.72 | 7.07 |
| 750.20 | 0.00 | 750.71 | 2.52 | 751.22 | 3.52 | 751.73 | 7.31 |
| 750.21 | 0.00 | 750.72 | 2.70 | 751.23 | 3.52 | 751.74 | 7.55 |
| 750.22 | 0.00 | 750.73 | 2.89 | 751.24 | 3.53 | 751.75 | 7.79 |
| 750.23 | 0.00 | 750.74 | 3.08 | 751.25 | 3.53 | 751.76 | 8.04 |
| 750.24 | 0.00 | 750.75 | 3.27 | 751.26 | 3.54 | 751.77 | 8.29 |
| 750.25 | 0.00 | 750.76 | 3.33 | 751.27 | 3.54 | 751.78 | 8.55 |
| 750.26 | 0.00 | 750.77 | 3.33 | 751.28 | 3.54 | 751.79 | 8.81 |
| 750.27 | 0.00 | 750.78 | 3.34 | 751.29 | 3.55 | 751.80 | 9.08 |
| 750.28 | 0.00 | 750.79 | 3.34 | 751.30 | 3.55 | 751.81 | 9.35 |
| 750.29 | 0.00 | 750.80 | 3.35 | 751.31 | 3.56 | 751.82 | 9.63 |
| 750.30 | 0.00 | 750.81 | 3.35 | 751.32 | 3.56 | 751.83 | 9.91 |
| 750.31 | 0.00 | 750.82 | 3.36 | 751.33 | 3.56 | 751.84 | 10.19 |
| 750.32 | 0.00 | 750.83 | 3.36 | 751.34 | 3.57 | 751.85 | 10.48 |
| 750.33 | 0.00 | 750.84 | 3.36 | 751.35 | 3.57 | 751.86 | 10.78 |
| 750.34 | 0.00 | 750.85 | 3.37 | 751.36 | 3.58 | 751.87 | 11.07 |
| 750.35 | 0.00 | 750.86 | 3.37 | 751.37 | 3.58 | 751.88 | 11.37 |
| 750.36 | 0.00 | 750.87 | 3.38 | 751.38 | 3.58 | 751.89 | 11.68 |
| 750.37 | 0.00 | 750.88 | 3.38 | 751.39 | 3.59 | 751.90 | 11.98 |
| 750.38 | 0.00 | 750.89 | 3.39 | 751.40 | 3.59 | 751.91 | 12.30 |
| 750.39 | 0.00 | 750.90 | 3.39 | 751.41 | 3.60 | 751.92 | 12.61 |
| 750.40 | 0.00 | 750.91 | 3.39 | 751.42 | 3.60 | 751.93 | 12.93 |
| 750.41 | 0.00 | 750.92 | 3.40 | 751.43 | 3.60 | 751.94 | 13.25 |
| 750.42 | 0.00 | 750.93 | 3.40 | 751.44 | 3.61 | 751.95 | 13.58 |
| 750.43 | 0.00 | 750.94 | 3.41 | 751.45 | 3.61 | 751.96 | 13.91 |
| 750.44 | 0.00 | 750.95 | 3.41 | 751.46 | 3.62 | 751.97 | 14.24 |
| 750.45 | 0.00 | 750.96 | 3.41 | 751.47 | 3.62 | 751.98 | 14.58 |
| 750.46 | 0.00 | 750.97 | 3.42 | 751.48 | 3.62 | 751.99 | 14.92 |
| 750.47 | 0.00 | 750.98 | 3.42 | 751.49 | 3.63 | 752.00 | 15.26 |
| 750.48 | 0.00 | 750.99 | 3.43 | 751.50 | 3.63 | | |
| 750.49 | 0.00 | 751.00 | 3.43 | 751.51 | 3.67 | | |
| 750.50 | 0.00 | 751.01 | 3.43 | 751.52 | 3.73 | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Stage-Area-Storage for Pond B-3: Bioretention B-3

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 750.00 | 12,000 | 0 | 751.02 | 18,120 | 15,361 |
| 750.02 | 12,120 | 241 | 751.04 | 18,240 | 15,725 |
| 750.04 | 12,240 | 485 | 751.06 | 18,360 | 16,091 |
| 750.06 | 12,360 | 731 | 751.08 | 18,480 | 16,459 |
| 750.08 | 12,480 | 979 | 751.10 | 18,600 | 16,830 |
| 750.10 | 12,600 | 1,230 | 751.12 | 18,720 | 17,203 |
| 750.12 | 12,720 | 1,483 | 751.14 | 18,840 | 17,579 |
| 750.14 | 12,840 | 1,739 | 751.16 | 18,960 | 17,957 |
| 750.16 | 12,960 | 1,997 | 751.18 | 19,080 | 18,337 |
| 750.18 | 13,080 | 2,257 | 751.20 | 19,200 | 18,720 |
| 750.20 | 13,200 | 2,520 | 751.22 | 19,320 | 19,105 |
| 750.22 | 13,320 | 2,785 | 751.24 | 19,440 | 19,493 |
| 750.24 | 13,440 | 3,053 | 751.26 | 19,560 | 19,883 |
| 750.26 | 13,560 | 3,323 | 751.28 | 19,680 | 20,275 |
| 750.28 | 13,680 | 3,595 | 751.30 | 19,800 | 20,670 |
| 750.30 | 13,800 | 3,870 | 751.32 | 19,920 | 21,067 |
| 750.32 | 13,920 | 4,147 | 751.34 | 20,040 | 21,467 |
| 750.34 | 14,040 | 4,427 | 751.36 | 20,160 | 21,869 |
| 750.36 | 14,160 | 4,709 | 751.38 | 20,280 | 22,273 |
| 750.38 | 14,280 | 4,993 | 751.40 | 20,400 | 22,680 |
| 750.40 | 14,400 | 5,280 | 751.42 | 20,520 | 23,089 |
| 750.42 | 14,520 | 5,569 | 751.44 | 20,640 | 23,501 |
| 750.44 | 14,640 | 5,861 | 751.46 | 20,760 | 23,915 |
| 750.46 | 14,760 | 6,155 | 751.48 | 20,880 | 24,331 |
| 750.48 | 14,880 | 6,451 | 751.50 | 21,000 | 24,750 |
| 750.50 | 15,000 | 6,750 | 751.52 | 21,120 | 25,171 |
| 750.52 | 15,120 | 7,051 | 751.54 | 21,240 | 25,595 |
| 750.54 | 15,240 | 7,355 | 751.56 | 21,360 | 26,021 |
| 750.56 | 15,360 | 7,661 | 751.58 | 21,480 | 26,449 |
| 750.58 | 15,480 | 7,969 | 751.60 | 21,600 | 26,880 |
| 750.60 | 15,600 | 8,280 | 751.62 | 21,720 | 27,313 |
| 750.62 | 15,720 | 8,593 | 751.64 | 21,840 | 27,749 |
| 750.64 | 15,840 | 8,909 | 751.66 | 21,960 | 28,187 |
| 750.66 | 15,960 | 9,227 | 751.68 | 22,080 | 28,627 |
| 750.68 | 16,080 | 9,547 | 751.70 | 22,200 | 29,070 |
| 750.70 | 16,200 | 9,870 | 751.72 | 22,320 | 29,515 |
| 750.72 | 16,320 | 10,195 | 751.74 | 22,440 | 29,963 |
| 750.74 | 16,440 | 10,523 | 751.76 | 22,560 | 30,413 |
| 750.76 | 16,560 | 10,853 | 751.78 | 22,680 | 30,865 |
| 750.78 | 16,680 | 11,185 | 751.80 | 22,800 | 31,320 |
| 750.80 | 16,800 | 11,520 | 751.82 | 22,920 | 31,777 |
| 750.82 | 16,920 | 11,857 | 751.84 | 23,040 | 32,237 |
| 750.84 | 17,040 | 12,197 | 751.86 | 23,160 | 32,699 |
| 750.86 | 17,160 | 12,539 | 751.88 | 23,280 | 33,163 |
| 750.88 | 17,280 | 12,883 | 751.90 | 23,400 | 33,630 |
| 750.90 | 17,400 | 13,230 | 751.92 | 23,520 | 34,099 |
| 750.92 | 17,520 | 13,579 | 751.94 | 23,640 | 34,571 |
| 750.94 | 17,640 | 13,931 | 751.96 | 23,760 | 35,045 |
| 750.96 | 17,760 | 14,285 | 751.98 | 23,880 | 35,521 |
| 750.98 | 17,880 | 14,641 | 752.00 | 24,000 | 36,000 |
| 751.00 | 18,000 | 15,000 | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Pond B-4: Bioretention B-4

Inflow Area = 2.572 ac, 78.93% Impervious, Inflow Depth = 2.50" for 10-yr event
Inflow = 10.29 cfs @ 11.96 hrs, Volume= 0.535 af
Outflow = 5.85 cfs @ 12.05 hrs, Volume= 0.463 af, Atten= 43%, Lag= 5.4 min
Primary = 5.85 cfs @ 12.05 hrs, Volume= 0.463 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 754.09' @ 12.05 hrs Surf.Area= 7,087 sf Storage= 7,113 cf

Plug-Flow detention time= 111.0 min calculated for 0.463 af (87% of inflow)
Center-of-Mass det. time= 48.5 min (832.8 - 784.4)

| Volume | Invert | Avail.Storage | Storage Description |
|---------------------|----------------------|---------------------------|--|
| #1 | 753.00' | 14,000 cf | Surf. Storage (Prismatic) Listed below (Recalc) |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 753.00 | 6,000 | 0 | 0 |
| 755.00 | 8,000 | 14,000 | 14,000 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|---------|--|
| #1 | Primary | 749.50' | 12.0" Round Culvert-Primary L= 230.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 749.50' / 746.50' S= 0.0130 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf |
| #2 | Device 1 | 753.50' | 24.0" x 24.0" Horiz. Grate-Primary C= 0.600 Limited to weir flow at low heads |
| #3 | Primary | 754.50' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=5.85 cfs @ 12.05 hrs HW=754.08' TW=0.00' (Dynamic Tailwater)

- 1=Culvert-Primary (Barrel Controls 5.85 cfs @ 7.44 fps)
- 2=Grate-Primary (Passes 5.85 cfs of 11.66 cfs potential flow)
- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Proposed Conditions I

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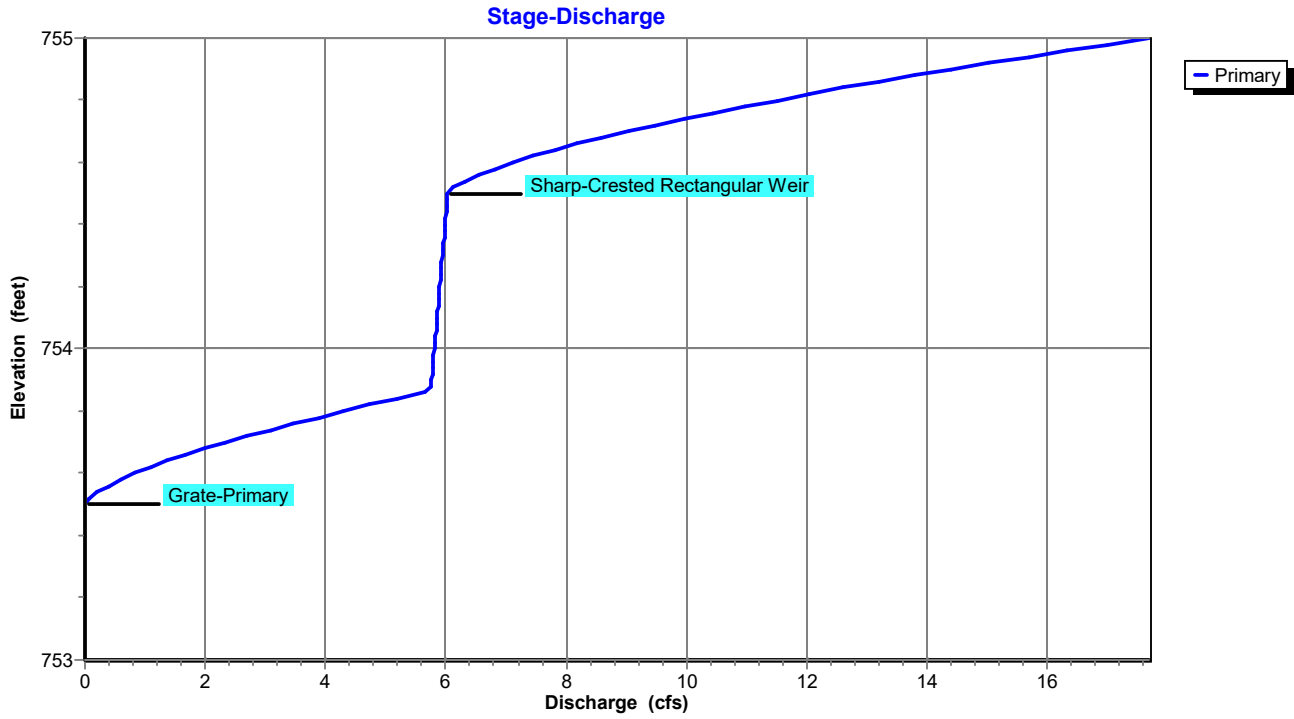
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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

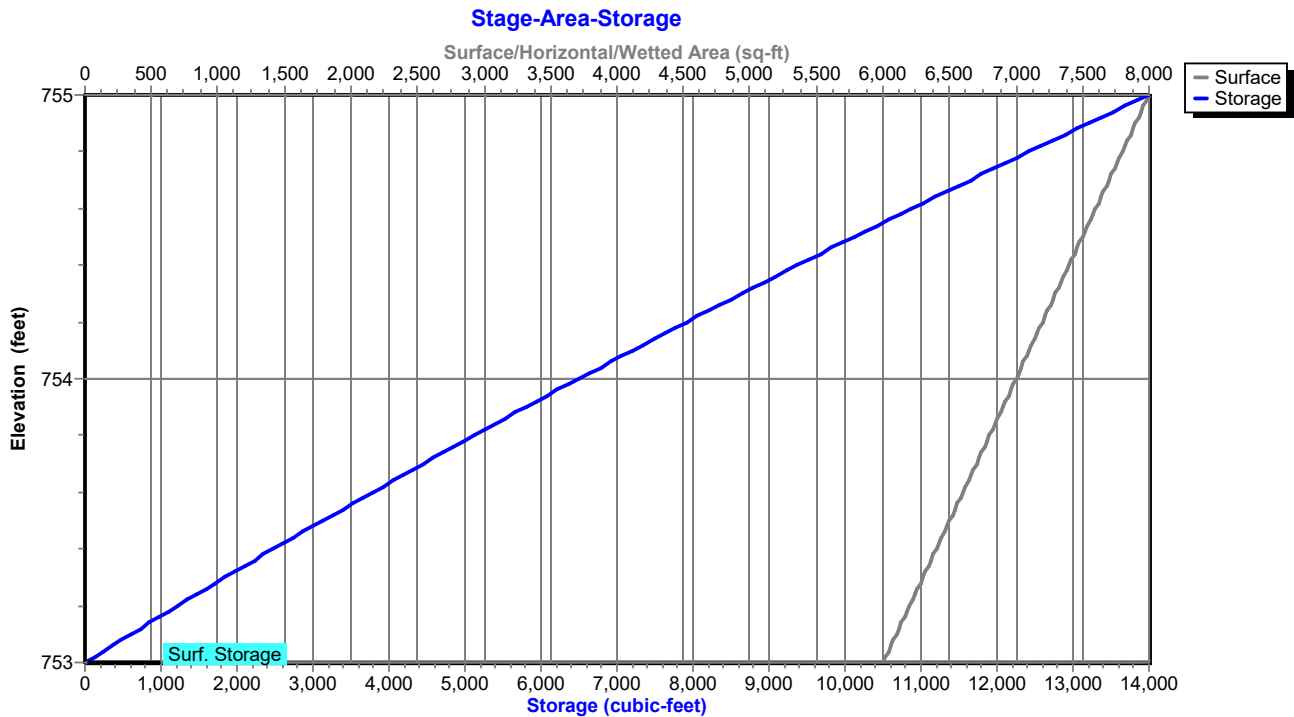
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Pond B-4: Bioretention B-4



Pond B-4: Bioretention B-4



Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Stage-Discharge for Pond B-4: Bioretention B-4

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|
| 753.00 | 0.00 | 753.51 | 0.03 | 754.02 | 5.82 | 754.53 | 6.21 |
| 753.01 | 0.00 | 753.52 | 0.07 | 754.03 | 5.82 | 754.54 | 6.31 |
| 753.02 | 0.00 | 753.53 | 0.14 | 754.04 | 5.83 | 754.55 | 6.41 |
| 753.03 | 0.00 | 753.54 | 0.21 | 754.05 | 5.83 | 754.56 | 6.53 |
| 753.04 | 0.00 | 753.55 | 0.29 | 754.06 | 5.84 | 754.57 | 6.66 |
| 753.05 | 0.00 | 753.56 | 0.38 | 754.07 | 5.84 | 754.58 | 6.80 |
| 753.06 | 0.00 | 753.57 | 0.48 | 754.08 | 5.84 | 754.59 | 6.95 |
| 753.07 | 0.00 | 753.58 | 0.59 | 754.09 | 5.85 | 754.60 | 7.10 |
| 753.08 | 0.00 | 753.59 | 0.71 | 754.10 | 5.85 | 754.61 | 7.27 |
| 753.09 | 0.00 | 753.60 | 0.83 | 754.11 | 5.86 | 754.62 | 7.44 |
| 753.10 | 0.00 | 753.61 | 0.95 | 754.12 | 5.86 | 754.63 | 7.61 |
| 753.11 | 0.00 | 753.62 | 1.09 | 754.13 | 5.87 | 754.64 | 7.80 |
| 753.12 | 0.00 | 753.63 | 1.23 | 754.14 | 5.87 | 754.65 | 7.99 |
| 753.13 | 0.00 | 753.64 | 1.37 | 754.15 | 5.88 | 754.66 | 8.18 |
| 753.14 | 0.00 | 753.65 | 1.52 | 754.16 | 5.88 | 754.67 | 8.38 |
| 753.15 | 0.00 | 753.66 | 1.67 | 754.17 | 5.88 | 754.68 | 8.59 |
| 753.16 | 0.00 | 753.67 | 1.83 | 754.18 | 5.89 | 754.69 | 8.81 |
| 753.17 | 0.00 | 753.68 | 2.00 | 754.19 | 5.89 | 754.70 | 9.03 |
| 753.18 | 0.00 | 753.69 | 2.17 | 754.20 | 5.90 | 754.71 | 9.25 |
| 753.19 | 0.00 | 753.70 | 2.34 | 754.21 | 5.90 | 754.72 | 9.48 |
| 753.20 | 0.00 | 753.71 | 2.52 | 754.22 | 5.91 | 754.73 | 9.72 |
| 753.21 | 0.00 | 753.72 | 2.70 | 754.23 | 5.91 | 754.74 | 9.96 |
| 753.22 | 0.00 | 753.73 | 2.89 | 754.24 | 5.91 | 754.75 | 10.20 |
| 753.23 | 0.00 | 753.74 | 3.08 | 754.25 | 5.92 | 754.76 | 10.45 |
| 753.24 | 0.00 | 753.75 | 3.27 | 754.26 | 5.92 | 754.77 | 10.71 |
| 753.25 | 0.00 | 753.76 | 3.47 | 754.27 | 5.93 | 754.78 | 10.96 |
| 753.26 | 0.00 | 753.77 | 3.67 | 754.28 | 5.93 | 754.79 | 11.23 |
| 753.27 | 0.00 | 753.78 | 3.88 | 754.29 | 5.94 | 754.80 | 11.50 |
| 753.28 | 0.00 | 753.79 | 4.09 | 754.30 | 5.94 | 754.81 | 11.77 |
| 753.29 | 0.00 | 753.80 | 4.30 | 754.31 | 5.95 | 754.82 | 12.05 |
| 753.30 | 0.00 | 753.81 | 4.52 | 754.32 | 5.95 | 754.83 | 12.33 |
| 753.31 | 0.00 | 753.82 | 4.74 | 754.33 | 5.95 | 754.84 | 12.61 |
| 753.32 | 0.00 | 753.83 | 4.96 | 754.34 | 5.96 | 754.85 | 12.90 |
| 753.33 | 0.00 | 753.84 | 5.19 | 754.35 | 5.96 | 754.86 | 13.19 |
| 753.34 | 0.00 | 753.85 | 5.42 | 754.36 | 5.97 | 754.87 | 13.49 |
| 753.35 | 0.00 | 753.86 | 5.65 | 754.37 | 5.97 | 754.88 | 13.79 |
| 753.36 | 0.00 | 753.87 | 5.75 | 754.38 | 5.98 | 754.89 | 14.10 |
| 753.37 | 0.00 | 753.88 | 5.75 | 754.39 | 5.98 | 754.90 | 14.40 |
| 753.38 | 0.00 | 753.89 | 5.76 | 754.40 | 5.98 | 754.91 | 14.72 |
| 753.39 | 0.00 | 753.90 | 5.76 | 754.41 | 5.99 | 754.92 | 15.03 |
| 753.40 | 0.00 | 753.91 | 5.77 | 754.42 | 5.99 | 754.93 | 15.35 |
| 753.41 | 0.00 | 753.92 | 5.77 | 754.43 | 6.00 | 754.94 | 15.67 |
| 753.42 | 0.00 | 753.93 | 5.78 | 754.44 | 6.00 | 754.95 | 16.00 |
| 753.43 | 0.00 | 753.94 | 5.78 | 754.45 | 6.01 | 754.96 | 16.33 |
| 753.44 | 0.00 | 753.95 | 5.79 | 754.46 | 6.01 | 754.97 | 16.66 |
| 753.45 | 0.00 | 753.96 | 5.79 | 754.47 | 6.01 | 754.98 | 17.00 |
| 753.46 | 0.00 | 753.97 | 5.80 | 754.48 | 6.02 | 754.99 | 17.34 |
| 753.47 | 0.00 | 753.98 | 5.80 | 754.49 | 6.02 | 755.00 | 17.68 |
| 753.48 | 0.00 | 753.99 | 5.80 | 754.50 | 6.03 | | |
| 753.49 | 0.00 | 754.00 | 5.81 | 754.51 | 6.06 | | |
| 753.50 | 0.00 | 754.01 | 5.81 | 754.52 | 6.13 | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Stage-Area-Storage for Pond B-4: Bioretention B-4

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 753.00 | 6,000 | 0 | 754.02 | 7,020 | 6,640 |
| 753.02 | 6,020 | 120 | 754.04 | 7,040 | 6,781 |
| 753.04 | 6,040 | 241 | 754.06 | 7,060 | 6,922 |
| 753.06 | 6,060 | 362 | 754.08 | 7,080 | 7,063 |
| 753.08 | 6,080 | 483 | 754.10 | 7,100 | 7,205 |
| 753.10 | 6,100 | 605 | 754.12 | 7,120 | 7,347 |
| 753.12 | 6,120 | 727 | 754.14 | 7,140 | 7,490 |
| 753.14 | 6,140 | 850 | 754.16 | 7,160 | 7,633 |
| 753.16 | 6,160 | 973 | 754.18 | 7,180 | 7,776 |
| 753.18 | 6,180 | 1,096 | 754.20 | 7,200 | 7,920 |
| 753.20 | 6,200 | 1,220 | 754.22 | 7,220 | 8,064 |
| 753.22 | 6,220 | 1,344 | 754.24 | 7,240 | 8,209 |
| 753.24 | 6,240 | 1,469 | 754.26 | 7,260 | 8,354 |
| 753.26 | 6,260 | 1,594 | 754.28 | 7,280 | 8,499 |
| 753.28 | 6,280 | 1,719 | 754.30 | 7,300 | 8,645 |
| 753.30 | 6,300 | 1,845 | 754.32 | 7,320 | 8,791 |
| 753.32 | 6,320 | 1,971 | 754.34 | 7,340 | 8,938 |
| 753.34 | 6,340 | 2,098 | 754.36 | 7,360 | 9,085 |
| 753.36 | 6,360 | 2,225 | 754.38 | 7,380 | 9,232 |
| 753.38 | 6,380 | 2,352 | 754.40 | 7,400 | 9,380 |
| 753.40 | 6,400 | 2,480 | 754.42 | 7,420 | 9,528 |
| 753.42 | 6,420 | 2,608 | 754.44 | 7,440 | 9,677 |
| 753.44 | 6,440 | 2,737 | 754.46 | 7,460 | 9,826 |
| 753.46 | 6,460 | 2,866 | 754.48 | 7,480 | 9,975 |
| 753.48 | 6,480 | 2,995 | 754.50 | 7,500 | 10,125 |
| 753.50 | 6,500 | 3,125 | 754.52 | 7,520 | 10,275 |
| 753.52 | 6,520 | 3,255 | 754.54 | 7,540 | 10,426 |
| 753.54 | 6,540 | 3,386 | 754.56 | 7,560 | 10,577 |
| 753.56 | 6,560 | 3,517 | 754.58 | 7,580 | 10,728 |
| 753.58 | 6,580 | 3,648 | 754.60 | 7,600 | 10,880 |
| 753.60 | 6,600 | 3,780 | 754.62 | 7,620 | 11,032 |
| 753.62 | 6,620 | 3,912 | 754.64 | 7,640 | 11,185 |
| 753.64 | 6,640 | 4,045 | 754.66 | 7,660 | 11,338 |
| 753.66 | 6,660 | 4,178 | 754.68 | 7,680 | 11,491 |
| 753.68 | 6,680 | 4,311 | 754.70 | 7,700 | 11,645 |
| 753.70 | 6,700 | 4,445 | 754.72 | 7,720 | 11,799 |
| 753.72 | 6,720 | 4,579 | 754.74 | 7,740 | 11,954 |
| 753.74 | 6,740 | 4,714 | 754.76 | 7,760 | 12,109 |
| 753.76 | 6,760 | 4,849 | 754.78 | 7,780 | 12,264 |
| 753.78 | 6,780 | 4,984 | 754.80 | 7,800 | 12,420 |
| 753.80 | 6,800 | 5,120 | 754.82 | 7,820 | 12,576 |
| 753.82 | 6,820 | 5,256 | 754.84 | 7,840 | 12,733 |
| 753.84 | 6,840 | 5,393 | 754.86 | 7,860 | 12,890 |
| 753.86 | 6,860 | 5,530 | 754.88 | 7,880 | 13,047 |
| 753.88 | 6,880 | 5,667 | 754.90 | 7,900 | 13,205 |
| 753.90 | 6,900 | 5,805 | 754.92 | 7,920 | 13,363 |
| 753.92 | 6,920 | 5,943 | 754.94 | 7,940 | 13,522 |
| 753.94 | 6,940 | 6,082 | 754.96 | 7,960 | 13,681 |
| 753.96 | 6,960 | 6,221 | 754.98 | 7,980 | 13,840 |
| 753.98 | 6,980 | 6,360 | 755.00 | 8,000 | 14,000 |
| 754.00 | 7,000 | 6,500 | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Pond P-1: Wet Pond P-1

Inflow Area = 22.268 ac, 71.72% Impervious, Inflow Depth = 2.13" for 10-yr event
 Inflow = 50.84 cfs @ 11.97 hrs, Volume= 3.958 af
 Outflow = 11.58 cfs @ 12.54 hrs, Volume= 3.950 af, Atten= 77%, Lag= 34.6 min
 Primary = 11.58 cfs @ 12.54 hrs, Volume= 3.950 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Peak Elev= 749.30' @ 12.54 hrs Surf.Area= 45,404 sf Storage= 64,599 cf

Plug-Flow detention time= 314.9 min calculated for 3.947 af (100% of inflow)
 Center-of-Mass det. time= 314.7 min (1,146.5 - 831.8)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|--|
| #1 | 740.00' | 0 cf | Retention (Irregular) Listed below (Recalc) 24,499 cf Overall x 0.0% Voids |
| #2 | 746.00' | 133,484 cf | Detention (Irregular) Listed below (Recalc) |
| | | 133,484 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|------------------|-------------------|---------------|------------------------|------------------------|------------------|
| 740.00 | 651 | 103.0 | 0 | 0 | 651 |
| 741.50 | 2,244 | 1,016.0 | 2,052 | 2,052 | 81,955 |
| 745.00 | 4,383 | 391.0 | 11,390 | 13,442 | 151,977 |
| 746.50 | 10,839 | 632.0 | 11,057 | 24,499 | 171,611 |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|------------------|-------------------|---------------|------------------------|------------------------|------------------|
| 746.00 | 11,459 | 563.0 | 0 | 0 | 11,459 |
| 747.00 | 13,760 | 587.0 | 12,592 | 12,592 | 13,729 |
| 748.00 | 19,120 | 930.0 | 16,367 | 28,959 | 55,143 |
| 749.00 | 32,528 | 1,810.0 | 25,529 | 54,488 | 247,025 |
| 750.00 | 39,522 | 1,836.0 | 35,968 | 90,456 | 254,786 |
| 751.00 | 46,632 | 1,863.0 | 43,028 | 133,484 | 262,946 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|---------|--|
| #1 | Primary | 742.25' | 30.0" Round Culvert L= 85.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 742.25' / 742.09' S= 0.0019 '/ Cc= 0.900 n= 0.012, Flow Area= 4.91 sf |
| #2 | Device 1 | 748.65' | 30.0" W x 30.0" H 9° Gate C= 0.600 Limited to weir flow at low heads |
| #3 | Primary | 749.65' | 20.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |
| #4 | Device 1 | 746.00' | 6.0" Round Culvert-Low Flow L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 745.50' / 746.00' S= -0.0333 '/ Cc= 0.900 n= 0.012, Flow Area= 0.20 sf |

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

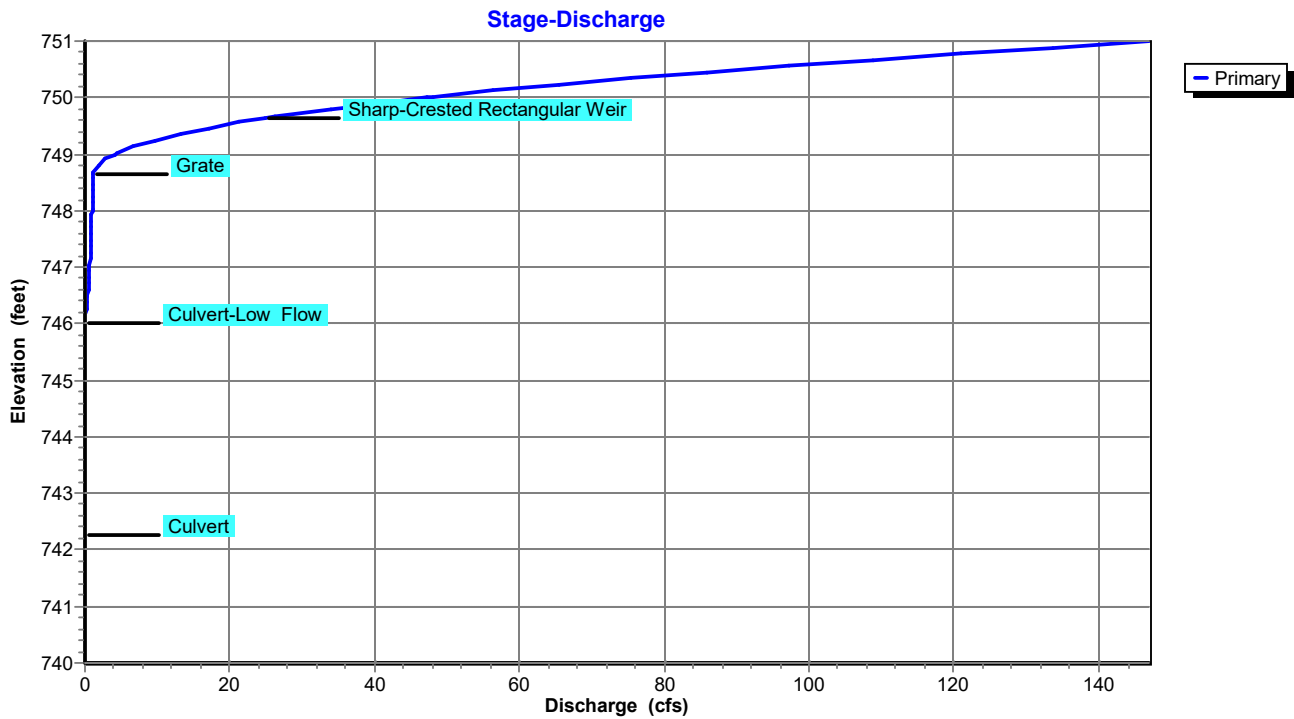
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Primary OutFlow Max=11.58 cfs @ 12.54 hrs HW=749.30' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 11.58 cfs of 56.93 cfs potential flow)
- 2=Gate (Weir Controls 10.27 cfs @ 2.27 fps)
- 4=Culvert-Low Flow (Inlet Controls 1.30 cfs @ 6.64 fps)
- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond P-1: Wet Pond P-1



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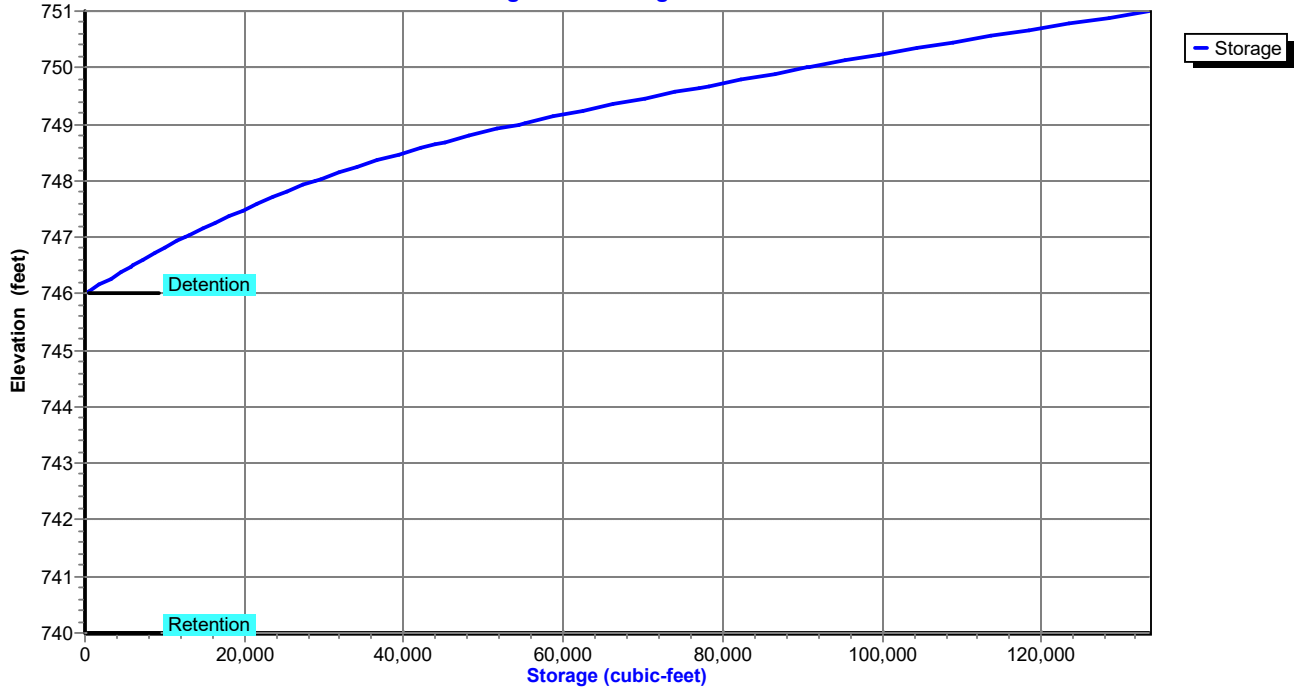
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Pond P-1: Wet Pond P-1

Stage-Area-Storage



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Stage-Discharge for Pond P-1: Wet Pond P-1

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|
| 740.00 | 0.00 | 743.06 | 0.00 | 746.12 | 0.03 | 749.18 | 7.99 |
| 740.06 | 0.00 | 743.12 | 0.00 | 746.18 | 0.07 | 749.24 | 9.69 |
| 740.12 | 0.00 | 743.18 | 0.00 | 746.24 | 0.12 | 749.30 | 11.54 |
| 740.18 | 0.00 | 743.24 | 0.00 | 746.30 | 0.18 | 749.36 | 13.52 |
| 740.24 | 0.00 | 743.30 | 0.00 | 746.36 | 0.24 | 749.42 | 15.63 |
| 740.30 | 0.00 | 743.36 | 0.00 | 746.42 | 0.31 | 749.48 | 17.85 |
| 740.36 | 0.00 | 743.42 | 0.00 | 746.48 | 0.36 | 749.54 | 20.19 |
| 740.42 | 0.00 | 743.48 | 0.00 | 746.54 | 0.40 | 749.60 | 22.63 |
| 740.48 | 0.00 | 743.54 | 0.00 | 746.60 | 0.44 | 749.66 | 25.23 |
| 740.54 | 0.00 | 743.60 | 0.00 | 746.66 | 0.48 | 749.72 | 29.02 |
| 740.60 | 0.00 | 743.66 | 0.00 | 746.72 | 0.51 | 749.78 | 33.50 |
| 740.66 | 0.00 | 743.72 | 0.00 | 746.78 | 0.54 | 749.84 | 36.78 |
| 740.72 | 0.00 | 743.78 | 0.00 | 746.84 | 0.57 | 749.90 | 40.44 |
| 740.78 | 0.00 | 743.84 | 0.00 | 746.90 | 0.60 | 749.96 | 44.42 |
| 740.84 | 0.00 | 743.90 | 0.00 | 746.96 | 0.63 | 750.02 | 48.69 |
| 740.90 | 0.00 | 743.96 | 0.00 | 747.02 | 0.65 | 750.08 | 53.22 |
| 740.96 | 0.00 | 744.02 | 0.00 | 747.08 | 0.68 | 750.14 | 58.00 |
| 741.02 | 0.00 | 744.08 | 0.00 | 747.14 | 0.70 | 750.20 | 63.01 |
| 741.08 | 0.00 | 744.14 | 0.00 | 747.20 | 0.73 | 750.26 | 68.22 |
| 741.14 | 0.00 | 744.20 | 0.00 | 747.26 | 0.75 | 750.32 | 73.65 |
| 741.20 | 0.00 | 744.26 | 0.00 | 747.32 | 0.77 | 750.38 | 79.26 |
| 741.26 | 0.00 | 744.32 | 0.00 | 747.38 | 0.79 | 750.44 | 85.06 |
| 741.32 | 0.00 | 744.38 | 0.00 | 747.44 | 0.81 | 750.50 | 91.04 |
| 741.38 | 0.00 | 744.44 | 0.00 | 747.50 | 0.83 | 750.56 | 97.19 |
| 741.44 | 0.00 | 744.50 | 0.00 | 747.56 | 0.85 | 750.62 | 103.50 |
| 741.50 | 0.00 | 744.56 | 0.00 | 747.62 | 0.87 | 750.68 | 109.97 |
| 741.56 | 0.00 | 744.62 | 0.00 | 747.68 | 0.89 | 750.74 | 116.60 |
| 741.62 | 0.00 | 744.68 | 0.00 | 747.74 | 0.91 | 750.80 | 123.37 |
| 741.68 | 0.00 | 744.74 | 0.00 | 747.80 | 0.93 | 750.86 | 130.29 |
| 741.74 | 0.00 | 744.80 | 0.00 | 747.86 | 0.95 | 750.92 | 137.35 |
| 741.80 | 0.00 | 744.86 | 0.00 | 747.92 | 0.96 | 750.98 | 144.55 |
| 741.86 | 0.00 | 744.92 | 0.00 | 747.98 | 0.98 | | |
| 741.92 | 0.00 | 744.98 | 0.00 | 748.04 | 1.00 | | |
| 741.98 | 0.00 | 745.04 | 0.00 | 748.10 | 1.02 | | |
| 742.04 | 0.00 | 745.10 | 0.00 | 748.16 | 1.03 | | |
| 742.10 | 0.00 | 745.16 | 0.00 | 748.22 | 1.05 | | |
| 742.16 | 0.00 | 745.22 | 0.00 | 748.28 | 1.06 | | |
| 742.22 | 0.00 | 745.28 | 0.00 | 748.34 | 1.08 | | |
| 742.28 | 0.00 | 745.34 | 0.00 | 748.40 | 1.09 | | |
| 742.34 | 0.00 | 745.40 | 0.00 | 748.46 | 1.11 | | |
| 742.40 | 0.00 | 745.46 | 0.00 | 748.52 | 1.12 | | |
| 742.46 | 0.00 | 745.52 | 0.00 | 748.58 | 1.14 | | |
| 742.52 | 0.00 | 745.58 | 0.00 | 748.64 | 1.15 | | |
| 742.58 | 0.00 | 745.64 | 0.00 | 748.70 | 1.27 | | |
| 742.64 | 0.00 | 745.70 | 0.00 | 748.76 | 1.54 | | |
| 742.70 | 0.00 | 745.76 | 0.00 | 748.82 | 1.95 | | |
| 742.76 | 0.00 | 745.82 | 0.00 | 748.88 | 2.51 | | |
| 742.82 | 0.00 | 745.88 | 0.00 | 748.94 | 3.21 | | |
| 742.88 | 0.00 | 745.94 | 0.00 | 749.00 | 4.07 | | |
| 742.94 | 0.00 | 746.00 | 0.00 | 749.06 | 5.12 | | |
| 743.00 | 0.00 | 746.06 | 0.01 | 749.12 | 6.46 | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Stage-Area-Storage for Pond P-1: Wet Pond P-1

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---------------------|-------------------------|---------------------|-------------------------|
| 740.00 | 0 | 747.65 | 22,616 |
| 740.15 | 0 | 747.80 | 25,249 |
| 740.30 | 0 | 747.95 | 28,010 |
| 740.45 | 0 | 748.10 | 30,929 |
| 740.60 | 0 | 748.25 | 34,112 |
| 740.75 | 0 | 748.40 | 37,575 |
| 740.90 | 0 | 748.55 | 41,333 |
| 741.05 | 0 | 748.70 | 45,396 |
| 741.20 | 0 | 748.85 | 49,777 |
| 741.35 | 0 | 749.00 | 54,488 |
| 741.50 | 0 | 749.15 | 59,442 |
| 741.65 | 0 | 749.30 | 64,548 |
| 741.80 | 0 | 749.45 | 69,809 |
| 741.95 | 0 | 749.60 | 75,227 |
| 742.10 | 0 | 749.75 | 80,803 |
| 742.25 | 0 | 749.90 | 86,540 |
| 742.40 | 0 | 750.05 | 92,440 |
| 742.55 | 0 | 750.20 | 98,497 |
| 742.70 | 0 | 750.35 | 104,710 |
| 742.85 | 0 | 750.50 | 111,081 |
| 743.00 | 0 | 750.65 | 117,612 |
| 743.15 | 0 | 750.80 | 124,305 |
| 743.30 | 0 | 750.95 | 131,161 |
| 743.45 | 0 | | |
| 743.60 | 0 | | |
| 743.75 | 0 | | |
| 743.90 | 0 | | |
| 744.05 | 0 | | |
| 744.20 | 0 | | |
| 744.35 | 0 | | |
| 744.50 | 0 | | |
| 744.65 | 0 | | |
| 744.80 | 0 | | |
| 744.95 | 0 | | |
| 745.10 | 0 | | |
| 745.25 | 0 | | |
| 745.40 | 0 | | |
| 745.55 | 0 | | |
| 745.70 | 0 | | |
| 745.85 | 0 | | |
| 746.00 | 0 | | |
| 746.15 | 1,744 | | |
| 746.30 | 3,537 | | |
| 746.45 | 5,382 | | |
| 746.60 | 7,278 | | |
| 746.75 | 9,227 | | |
| 746.90 | 11,228 | | |
| 747.05 | 13,286 | | |
| 747.20 | 15,444 | | |
| 747.35 | 17,716 | | |
| 747.50 | 20,105 | | |

Proposed Conditions I

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Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Link 1AT: DA #1A Total

Inflow Area = 56.205 ac, 63.22% Impervious, Inflow Depth = 2.11" for 10-yr event
Inflow = 61.72 cfs @ 12.23 hrs, Volume= 9.882 af
Primary = 61.72 cfs @ 12.23 hrs, Volume= 9.882 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Link DP-1: DP #1 - Rush Crk Trib.

Inflow Area = 56.205 ac, 63.22% Impervious, Inflow Depth = 2.11" for 10-yr event
Inflow = 61.72 cfs @ 12.23 hrs, Volume= 9.882 af
Primary = 61.72 cfs @ 12.23 hrs, Volume= 9.882 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Link DP-2: DP #2 - Smokes Crk

Inflow Area = 83.814 ac, 88.53% Impervious, Inflow Depth = 2.70" for 10-yr event
Inflow = 193.21 cfs @ 12.00 hrs, Volume= 18.824 af
Primary = 193.21 cfs @ 12.00 hrs, Volume= 18.824 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

10-yr Primary Outflow Imported from Proposed Conditions II~Link DP-2.hce

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Link DP-3: DP #3 - Rush Crk

Inflow Area = 55.981 ac, 45.79% Impervious, Inflow Depth > 1.93" for 10-yr event
Inflow = 56.47 cfs @ 12.34 hrs, Volume= 9.009 af
Primary = 56.47 cfs @ 12.34 hrs, Volume= 9.009 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

10-yr Primary Outflow Imported from Proposed Conditions III~Link DP-3.hce

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Proposed Conditions - I
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Link PT: Proposed Conditions Total Offsite

Inflow Area = 196.000 ac, 69.06% Impervious, Inflow Depth > 2.31" for 10-yr event
Inflow = 263.17 cfs @ 12.20 hrs, Volume= 37.715 af
Primary = 263.17 cfs @ 12.20 hrs, Volume= 37.715 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 1A-I: DA #1A-I

Runoff = 57.06 cfs @ 12.27 hrs, Volume= 5.863 af, Depth= 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 11.558 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 13.442 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 1.044 | 77 | Woods, Good, HSG D |
| 26.044 | 89 | Weighted Average |
| 12.602 | | 48.39% Pervious Area |
| 13.442 | | 51.61% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 26.7 | 150 | 0.0150 | 0.09 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 2.9 | 340 | 0.0150 | 1.97 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 0.4 | 75 | 0.0200 | 2.87 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.8 | 760 | | 4.50 | | Direct Entry, Pipe Flow |
| 32.8 | 1,325 | Total | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 1A-II: DA #1A-II

Runoff = 48.91 cfs @ 11.96 hrs, Volume= 2.522 af, Depth= 2.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 2.746 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 6.783 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.587 | 77 | Woods, Good, HSG D |
| 10.116 | 92 | Weighted Average |
| 3.333 | | 32.95% Pervious Area |
| 6.783 | | 67.05% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.6 | 100 | 0.0170 | 1.07 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 0.9 | 140 | 0.0170 | 2.65 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.3 | 630 | | 4.50 | | Direct Entry, Pipe Flow |
| 4.8 | 870 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 1A-III: DA #1A-III

Runoff = 27.74 cfs @ 11.96 hrs, Volume= 1.487 af, Depth= 3.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.883 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 4.519 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 5.402 | 95 | Weighted Average |
| 0.883 | | 16.35% Pervious Area |
| 4.519 | | 83.65% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|----------------------|----------------|--|
| 1.6 | 100 | 0.0170 | 1.07 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 1.3 | 205 | 0.0170 | 2.65 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.9 | 305 | Total, | Increased to minimum | Tc = 6.0 min | |

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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 1A-IV: DA #1A-IV

Runoff = 32.64 cfs @ 11.96 hrs, Volume= 1.683 af, Depth= 2.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 2.082 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 4.668 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 6.750 | 92 | Weighted Average |
| 2.082 | | 30.84% Pervious Area |
| 4.668 | | 69.16% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.6 | 100 | 0.0170 | 1.07 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 0.7 | 110 | 0.0170 | 2.65 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.4 | 360 | | 2.50 | | Direct Entry, |
| 4.7 | 570 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 1A-V: DA #1A-V

Runoff = 26.84 cfs @ 11.96 hrs, Volume= 1.418 af, Depth= 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 1.233 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 4.088 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 5.321 | 94 | Weighted Average |
| 1.233 | | 23.17% Pervious Area |
| 4.088 | | 76.83% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|--|-------------------|----------------|--|
| 1.6 | 100 | 0.0170 | 1.07 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 1.4 | 225 | 0.0170 | 2.65 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 1.3 | 200 | | 2.50 | | Direct Entry, Swale Flow |
| 4.3 | 525 | Total, Increased to minimum Tc = 6.0 min | | | |

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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 1A-VI: DA #1A-V

Runoff = 12.97 cfs @ 11.96 hrs, Volume= 0.685 af, Depth= 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.542 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 2.030 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 2.572 | 94 | Weighted Average |
| 0.542 | | 21.07% Pervious Area |
| 2.030 | | 78.93% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.5 | 100 | 0.0200 | 1.14 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 2.0 | 350 | 0.0200 | 2.87 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 1.3 | 200 | | 2.50 | | Direct Entry, Swale Flow |
| 4.8 | 650 | | | | Total, Increased to minimum Tc = 6.0 min |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Pond B-1: Bioretention B-1

Inflow Area = 5.402 ac, 83.65% Impervious, Inflow Depth = 3.30" for 25-yr event
Inflow = 27.74 cfs @ 11.96 hrs, Volume= 1.487 af
Outflow = 16.00 cfs @ 12.05 hrs, Volume= 1.331 af, Atten= 42%, Lag= 5.1 min
Primary = 7.77 cfs @ 11.89 hrs, Volume= 1.134 af
Secondary = 9.31 cfs @ 12.06 hrs, Volume= 0.198 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 750.75' @ 12.06 hrs Surf.Area= 15,303 sf Storage= 21,407 cf

Plug-Flow detention time= 111.8 min calculated for 1.331 af (90% of inflow)
Center-of-Mass det. time= 57.9 min (829.7 - 771.8)

| Volume | Invert | Avail.Storage | Storage Description |
|------------------|-------------------|------------------------|--|
| #1 | 749.25' | 29,200 cf | Surf. Storage (Prismatic) Listed below (Recalc) |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 749.25 | 13,200 | 0 | 0 |
| 751.25 | 16,000 | 29,200 | 29,200 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|---|
| #1 | Primary | 747.25' | 15.0" Round Culvert-Primary L= 87.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 747.25' / 747.00' S= 0.0029 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf |
| #2 | Device 1 | 749.75' | 24.0" x 24.0" Horiz. Grate-Primary C= 0.600 Limited to weir flow at low heads |
| #3 | Primary | 751.00' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |
| #4 | Secondary | 745.75' | 15.0" Round Culvert-Secondary L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 745.75' / 744.13' S= 0.0360 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf |
| #5 | Device 4 | 750.25' | 24.0" x 24.0" Horiz. Grate-Secondary C= 0.600 Limited to weir flow at low heads |

Primary OutFlow Max=7.22 cfs @ 11.89 hrs HW=750.31' TW=748.57' (Dynamic Tailwater)

- 1=Culvert-Primary (Outlet Controls 7.22 cfs @ 5.89 fps)
- 2=Grate-Primary (Passes 7.22 cfs of 10.99 cfs potential flow)
- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Secondary OutFlow Max=9.15 cfs @ 12.06 hrs HW=750.75' TW=0.00' (Dynamic Tailwater)

- 4=Culvert-Secondary (Passes 9.15 cfs of 12.35 cfs potential flow)
- 5=Grate-Secondary (Weir Controls 9.15 cfs @ 2.30 fps)

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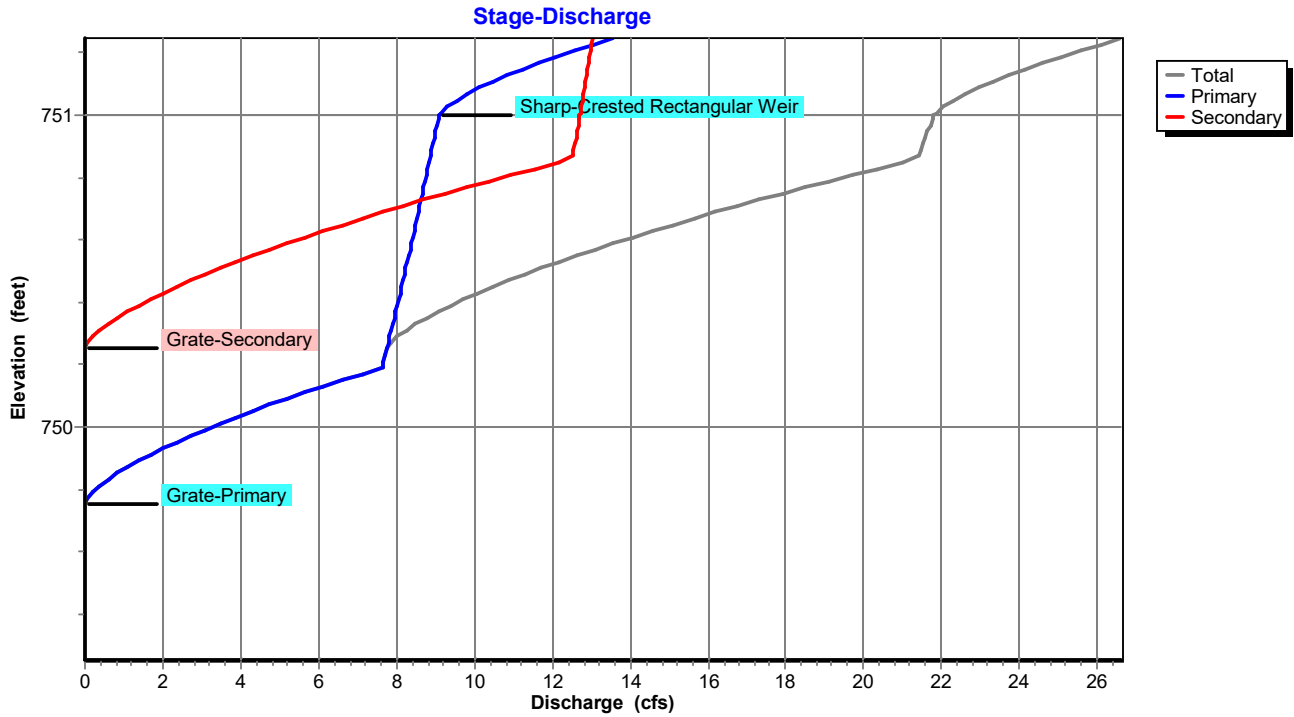
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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

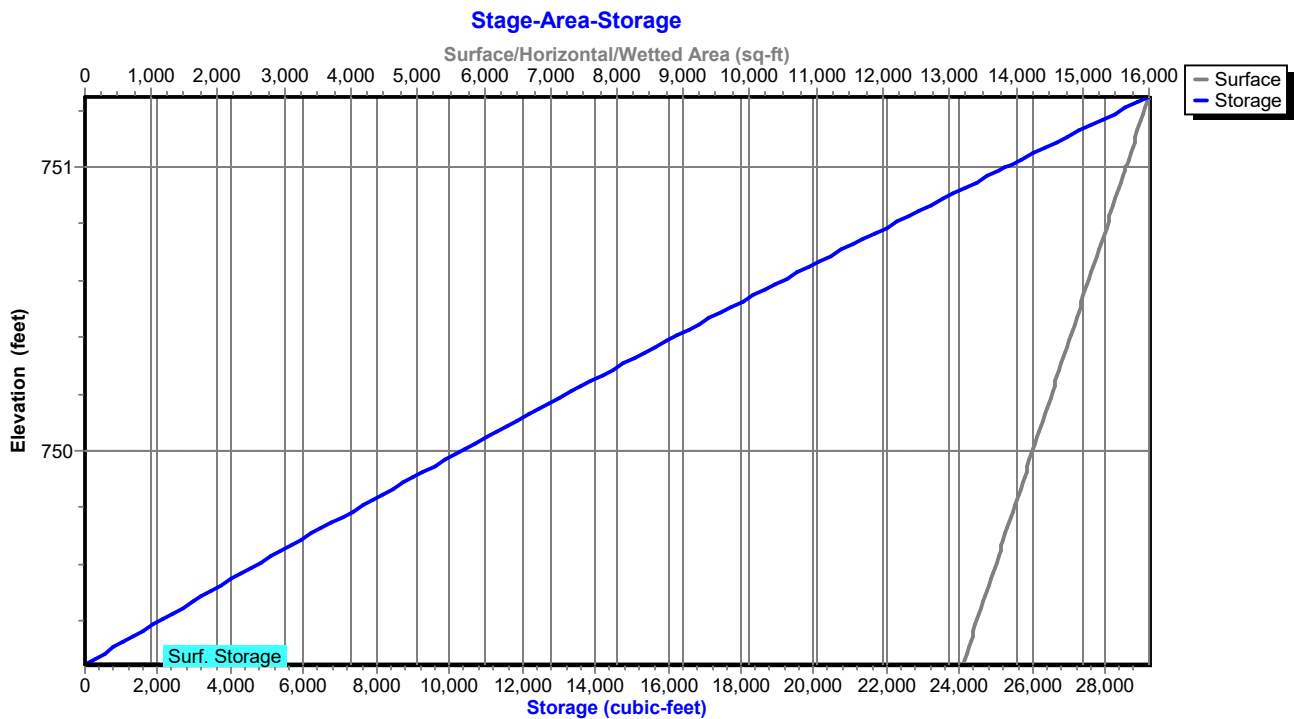
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Pond B-1: Bioretention B-1



Pond B-1: Bioretention B-1



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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Stage-Discharge for Pond B-1: Bioretention B-1

| Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) | Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) |
|---------------------|--------------------|------------------|--------------------|---------------------|--------------------|------------------|--------------------|
| 749.25 | 0.00 | 0.00 | 0.00 | 750.27 | 7.86 | 7.79 | 0.07 |
| 749.27 | 0.00 | 0.00 | 0.00 | 750.29 | 8.04 | 7.83 | 0.21 |
| 749.29 | 0.00 | 0.00 | 0.00 | 750.31 | 8.25 | 7.87 | 0.38 |
| 749.31 | 0.00 | 0.00 | 0.00 | 750.33 | 8.50 | 7.90 | 0.59 |
| 749.33 | 0.00 | 0.00 | 0.00 | 750.35 | 8.77 | 7.94 | 0.83 |
| 749.35 | 0.00 | 0.00 | 0.00 | 750.37 | 9.07 | 7.98 | 1.09 |
| 749.37 | 0.00 | 0.00 | 0.00 | 750.39 | 9.39 | 8.02 | 1.37 |
| 749.39 | 0.00 | 0.00 | 0.00 | 750.41 | 9.73 | 8.06 | 1.67 |
| 749.41 | 0.00 | 0.00 | 0.00 | 750.43 | 10.09 | 8.09 | 2.00 |
| 749.43 | 0.00 | 0.00 | 0.00 | 750.45 | 10.47 | 8.13 | 2.34 |
| 749.45 | 0.00 | 0.00 | 0.00 | 750.47 | 10.87 | 8.17 | 2.70 |
| 749.47 | 0.00 | 0.00 | 0.00 | 750.49 | 11.28 | 8.20 | 3.08 |
| 749.49 | 0.00 | 0.00 | 0.00 | 750.51 | 11.71 | 8.24 | 3.47 |
| 749.51 | 0.00 | 0.00 | 0.00 | 750.53 | 12.15 | 8.28 | 3.88 |
| 749.53 | 0.00 | 0.00 | 0.00 | 750.55 | 12.61 | 8.31 | 4.30 |
| 749.55 | 0.00 | 0.00 | 0.00 | 750.57 | 13.08 | 8.35 | 4.74 |
| 749.57 | 0.00 | 0.00 | 0.00 | 750.59 | 13.57 | 8.38 | 5.19 |
| 749.59 | 0.00 | 0.00 | 0.00 | 750.61 | 14.07 | 8.42 | 5.65 |
| 749.61 | 0.00 | 0.00 | 0.00 | 750.63 | 14.58 | 8.46 | 6.13 |
| 749.63 | 0.00 | 0.00 | 0.00 | 750.65 | 15.11 | 8.49 | 6.62 |
| 749.65 | 0.00 | 0.00 | 0.00 | 750.67 | 15.65 | 8.53 | 7.12 |
| 749.67 | 0.00 | 0.00 | 0.00 | 750.69 | 16.20 | 8.56 | 7.64 |
| 749.69 | 0.00 | 0.00 | 0.00 | 750.71 | 16.76 | 8.60 | 8.16 |
| 749.71 | 0.00 | 0.00 | 0.00 | 750.73 | 17.33 | 8.63 | 8.70 |
| 749.73 | 0.00 | 0.00 | 0.00 | 750.75 | 17.91 | 8.67 | 9.25 |
| 749.75 | 0.00 | 0.00 | 0.00 | 750.77 | 18.51 | 8.70 | 9.81 |
| 749.77 | 0.07 | 0.07 | 0.00 | 750.79 | 19.12 | 8.73 | 10.38 |
| 749.79 | 0.21 | 0.21 | 0.00 | 750.81 | 19.73 | 8.77 | 10.96 |
| 749.81 | 0.38 | 0.38 | 0.00 | 750.83 | 20.36 | 8.80 | 11.56 |
| 749.83 | 0.59 | 0.59 | 0.00 | 750.85 | 21.00 | 8.84 | 12.16 |
| 749.85 | 0.83 | 0.83 | 0.00 | 750.87 | 21.40 | 8.87 | 12.53 |
| 749.87 | 1.09 | 1.09 | 0.00 | 750.89 | 21.46 | 8.91 | 12.56 |
| 749.89 | 1.37 | 1.37 | 0.00 | 750.91 | 21.52 | 8.94 | 12.58 |
| 749.91 | 1.67 | 1.67 | 0.00 | 750.93 | 21.58 | 8.97 | 12.61 |
| 749.93 | 2.00 | 2.00 | 0.00 | 750.95 | 21.64 | 9.01 | 12.64 |
| 749.95 | 2.34 | 2.34 | 0.00 | 750.97 | 21.71 | 9.04 | 12.67 |
| 749.97 | 2.70 | 2.70 | 0.00 | 750.99 | 21.77 | 9.07 | 12.69 |
| 749.99 | 3.08 | 3.08 | 0.00 | 751.01 | 21.86 | 9.14 | 12.72 |
| 750.01 | 3.47 | 3.47 | 0.00 | 751.03 | 22.06 | 9.31 | 12.75 |
| 750.03 | 3.88 | 3.88 | 0.00 | 751.05 | 22.31 | 9.54 | 12.78 |
| 750.05 | 4.30 | 4.30 | 0.00 | 751.07 | 22.61 | 9.81 | 12.80 |
| 750.07 | 4.74 | 4.74 | 0.00 | 751.09 | 22.95 | 10.12 | 12.83 |
| 750.09 | 5.19 | 5.19 | 0.00 | 751.11 | 23.32 | 10.46 | 12.86 |
| 750.11 | 5.65 | 5.65 | 0.00 | 751.13 | 23.71 | 10.83 | 12.88 |
| 750.13 | 6.13 | 6.13 | 0.00 | 751.15 | 24.14 | 11.23 | 12.91 |
| 750.15 | 6.62 | 6.62 | 0.00 | 751.17 | 24.59 | 11.65 | 12.94 |
| 750.17 | 7.12 | 7.12 | 0.00 | 751.19 | 25.06 | 12.10 | 12.97 |
| 750.19 | 7.63 | 7.63 | 0.00 | 751.21 | 25.56 | 12.56 | 12.99 |
| 750.21 | 7.67 | 7.67 | 0.00 | 751.23 | 26.07 | 13.05 | 13.02 |
| 750.23 | 7.71 | 7.71 | 0.00 | 751.25 | 26.61 | 13.56 | 13.05 |
| 750.25 | 7.75 | 7.75 | 0.00 | | | | |

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Proposed Conditions - I
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Stage-Area-Storage for Pond B-1: Bioretention B-1

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 749.25 | 13,200 | 0 | 750.27 | 14,628 | 14,192 |
| 749.27 | 13,228 | 264 | 750.29 | 14,656 | 14,485 |
| 749.29 | 13,256 | 529 | 750.31 | 14,684 | 14,779 |
| 749.31 | 13,284 | 795 | 750.33 | 14,712 | 15,072 |
| 749.33 | 13,312 | 1,060 | 750.35 | 14,740 | 15,367 |
| 749.35 | 13,340 | 1,327 | 750.37 | 14,768 | 15,662 |
| 749.37 | 13,368 | 1,594 | 750.39 | 14,796 | 15,958 |
| 749.39 | 13,396 | 1,862 | 750.41 | 14,824 | 16,254 |
| 749.41 | 13,424 | 2,130 | 750.43 | 14,852 | 16,551 |
| 749.43 | 13,452 | 2,399 | 750.45 | 14,880 | 16,848 |
| 749.45 | 13,480 | 2,668 | 750.47 | 14,908 | 17,146 |
| 749.47 | 13,508 | 2,938 | 750.49 | 14,936 | 17,444 |
| 749.49 | 13,536 | 3,208 | 750.51 | 14,964 | 17,743 |
| 749.51 | 13,564 | 3,479 | 750.53 | 14,992 | 18,043 |
| 749.53 | 13,592 | 3,751 | 750.55 | 15,020 | 18,343 |
| 749.55 | 13,620 | 4,023 | 750.57 | 15,048 | 18,644 |
| 749.57 | 13,648 | 4,296 | 750.59 | 15,076 | 18,945 |
| 749.59 | 13,676 | 4,569 | 750.61 | 15,104 | 19,247 |
| 749.61 | 13,704 | 4,843 | 750.63 | 15,132 | 19,549 |
| 749.63 | 13,732 | 5,117 | 750.65 | 15,160 | 19,852 |
| 749.65 | 13,760 | 5,392 | 750.67 | 15,188 | 20,155 |
| 749.67 | 13,788 | 5,667 | 750.69 | 15,216 | 20,460 |
| 749.69 | 13,816 | 5,944 | 750.71 | 15,244 | 20,764 |
| 749.71 | 13,844 | 6,220 | 750.73 | 15,272 | 21,069 |
| 749.73 | 13,872 | 6,497 | 750.75 | 15,300 | 21,375 |
| 749.75 | 13,900 | 6,775 | 750.77 | 15,328 | 21,681 |
| 749.77 | 13,928 | 7,053 | 750.79 | 15,356 | 21,988 |
| 749.79 | 13,956 | 7,332 | 750.81 | 15,384 | 22,296 |
| 749.81 | 13,984 | 7,612 | 750.83 | 15,412 | 22,603 |
| 749.83 | 14,012 | 7,891 | 750.85 | 15,440 | 22,912 |
| 749.85 | 14,040 | 8,172 | 750.87 | 15,468 | 23,221 |
| 749.87 | 14,068 | 8,453 | 750.89 | 15,496 | 23,531 |
| 749.89 | 14,096 | 8,735 | 750.91 | 15,524 | 23,841 |
| 749.91 | 14,124 | 9,017 | 750.93 | 15,552 | 24,152 |
| 749.93 | 14,152 | 9,300 | 750.95 | 15,580 | 24,463 |
| 749.95 | 14,180 | 9,583 | 750.97 | 15,608 | 24,775 |
| 749.97 | 14,208 | 9,867 | 750.99 | 15,636 | 25,087 |
| 749.99 | 14,236 | 10,151 | 751.01 | 15,664 | 25,400 |
| 750.01 | 14,264 | 10,436 | 751.03 | 15,692 | 25,714 |
| 750.03 | 14,292 | 10,722 | 751.05 | 15,720 | 26,028 |
| 750.05 | 14,320 | 11,008 | 751.07 | 15,748 | 26,343 |
| 750.07 | 14,348 | 11,295 | 751.09 | 15,776 | 26,658 |
| 750.09 | 14,376 | 11,582 | 751.11 | 15,804 | 26,974 |
| 750.11 | 14,404 | 11,870 | 751.13 | 15,832 | 27,290 |
| 750.13 | 14,432 | 12,158 | 751.15 | 15,860 | 27,607 |
| 750.15 | 14,460 | 12,447 | 751.17 | 15,888 | 27,924 |
| 750.17 | 14,488 | 12,736 | 751.19 | 15,916 | 28,243 |
| 750.19 | 14,516 | 13,027 | 751.21 | 15,944 | 28,561 |
| 750.21 | 14,544 | 13,317 | 751.23 | 15,972 | 28,880 |
| 750.23 | 14,572 | 13,608 | 751.25 | 16,000 | 29,200 |
| 750.25 | 14,600 | 13,900 | | | |

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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Pond B-2: Bioretention B-2

Inflow Area = 6.750 ac, 69.16% Impervious, Inflow Depth = 2.99" for 25-yr event
Inflow = 32.64 cfs @ 11.96 hrs, Volume= 1.683 af
Outflow = 9.85 cfs @ 12.11 hrs, Volume= 1.489 af, Atten= 70%, Lag= 8.6 min
Primary = 4.73 cfs @ 12.10 hrs, Volume= 1.311 af
Secondary = 5.13 cfs @ 12.11 hrs, Volume= 0.178 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 751.09' @ 12.11 hrs Surf.Area= 26,907 sf Storage= 33,266 cf

Plug-Flow detention time= 137.0 min calculated for 1.489 af (88% of inflow)
Center-of-Mass det. time= 79.7 min (867.6 - 787.9)

| Volume | Invert | Avail.Storage | Storage Description |
|---------------------|----------------------|---------------------------|--|
| #1 | 749.50' | 45,000 cf | Surf. Storage (Prismatic) Listed below (Recalc) |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 749.50 | 15,000 | 0 | 0 |
| 751.50 | 30,000 | 45,000 | 45,000 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|--|
| #1 | Primary | 747.50' | 12.0" Round Culvert-Primary L= 105.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 747.50' / 747.25' S= 0.0024 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf |
| #2 | Device 1 | 750.00' | 24.0" x 24.0" Horiz. Grate-Primary C= 0.600 Limited to weir flow at low heads |
| #3 | Secondary | 746.00' | 12.0" Round Culvert-Secondary L= 130.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 746.00' / 738.10' S= 0.0608 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf |
| #4 | Device 3 | 750.75' | 24.0" x 24.0" Horiz. Grate-Secondary C= 0.600 Limited to weir flow at low heads |
| #5 | Primary | 751.00' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=4.64 cfs @ 12.10 hrs HW=751.09' TW=749.51' (Dynamic Tailwater)

↑ **1=Culvert-Primary** (Outlet Controls 3.81 cfs @ 4.86 fps)
↑ **2=Grate-Primary** (Passes 3.81 cfs of 20.07 cfs potential flow)
↑ **5=Sharp-Crested Rectangular Weir** (Weir Controls 0.82 cfs @ 0.96 fps)

Secondary OutFlow Max=5.04 cfs @ 12.11 hrs HW=751.08' TW=0.00' (Dynamic Tailwater)

↑ **3=Culvert-Secondary** (Passes 5.04 cfs of 8.10 cfs potential flow)
↑ **4=Grate-Secondary** (Weir Controls 5.04 cfs @ 1.89 fps)

Proposed Conditions I

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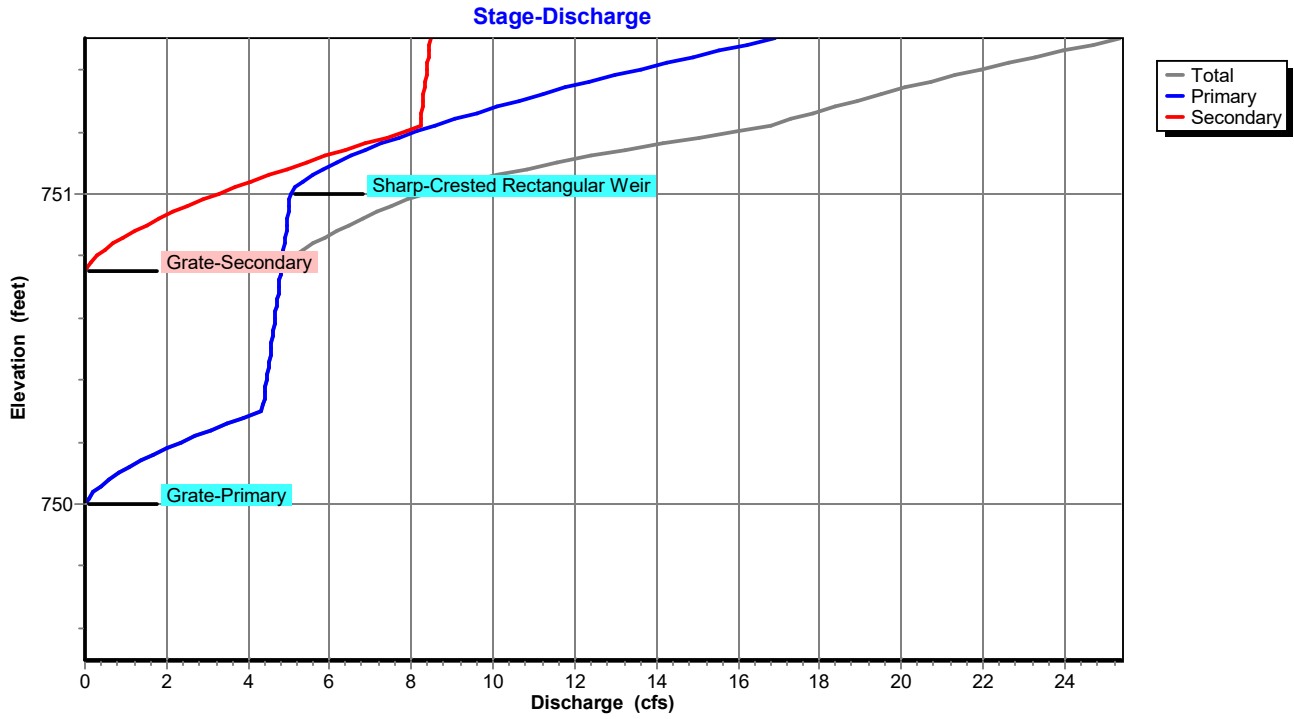
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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

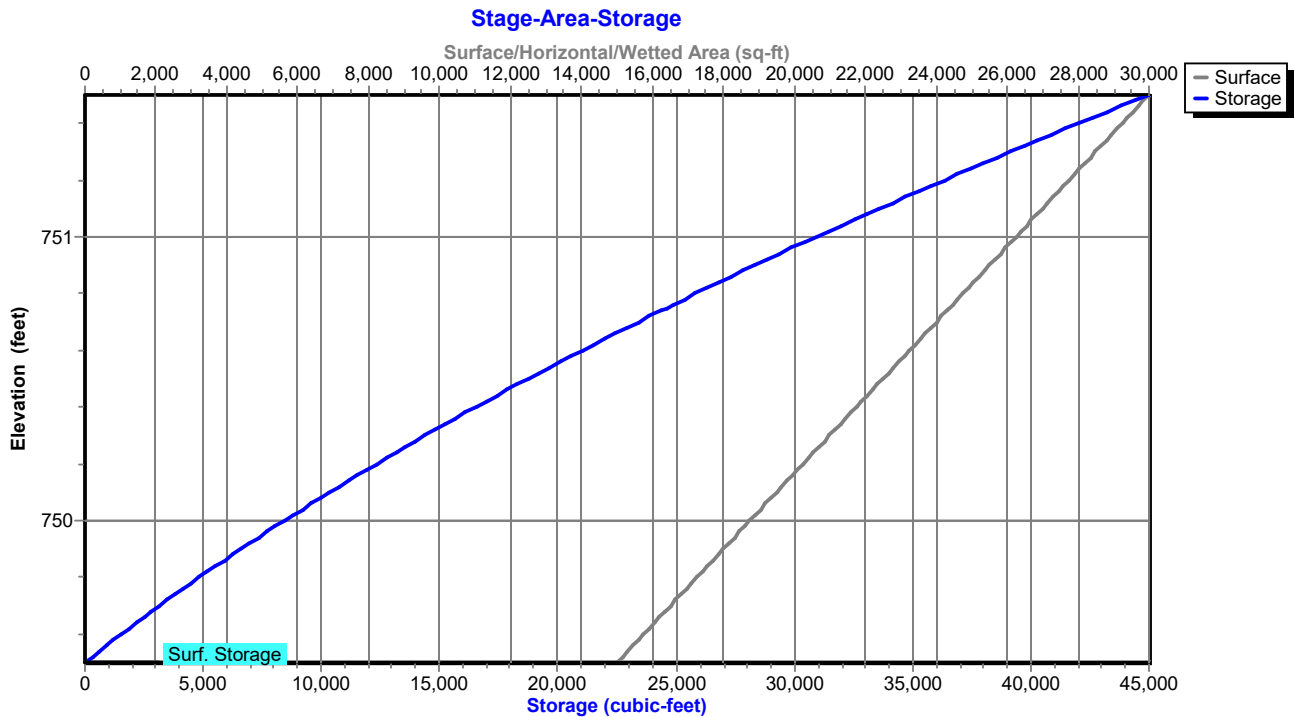
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Pond B-2: Bioretention B-2



Pond B-2: Bioretention B-2



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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Stage-Discharge for Pond B-2: Bioretention B-2

| Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) | Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) |
|---------------------|--------------------|------------------|--------------------|---------------------|--------------------|------------------|--------------------|
| 749.50 | 0.00 | 0.00 | 0.00 | 750.52 | 4.57 | 4.57 | 0.00 |
| 749.52 | 0.00 | 0.00 | 0.00 | 750.54 | 4.59 | 4.59 | 0.00 |
| 749.54 | 0.00 | 0.00 | 0.00 | 750.56 | 4.61 | 4.61 | 0.00 |
| 749.56 | 0.00 | 0.00 | 0.00 | 750.58 | 4.63 | 4.63 | 0.00 |
| 749.58 | 0.00 | 0.00 | 0.00 | 750.60 | 4.65 | 4.65 | 0.00 |
| 749.60 | 0.00 | 0.00 | 0.00 | 750.62 | 4.67 | 4.67 | 0.00 |
| 749.62 | 0.00 | 0.00 | 0.00 | 750.64 | 4.69 | 4.69 | 0.00 |
| 749.64 | 0.00 | 0.00 | 0.00 | 750.66 | 4.71 | 4.71 | 0.00 |
| 749.66 | 0.00 | 0.00 | 0.00 | 750.68 | 4.73 | 4.73 | 0.00 |
| 749.68 | 0.00 | 0.00 | 0.00 | 750.70 | 4.75 | 4.75 | 0.00 |
| 749.70 | 0.00 | 0.00 | 0.00 | 750.72 | 4.77 | 4.77 | 0.00 |
| 749.72 | 0.00 | 0.00 | 0.00 | 750.74 | 4.79 | 4.79 | 0.00 |
| 749.74 | 0.00 | 0.00 | 0.00 | 750.76 | 4.84 | 4.81 | 0.03 |
| 749.76 | 0.00 | 0.00 | 0.00 | 750.78 | 4.97 | 4.83 | 0.14 |
| 749.78 | 0.00 | 0.00 | 0.00 | 750.80 | 5.14 | 4.85 | 0.29 |
| 749.80 | 0.00 | 0.00 | 0.00 | 750.82 | 5.35 | 4.87 | 0.48 |
| 749.82 | 0.00 | 0.00 | 0.00 | 750.84 | 5.59 | 4.89 | 0.71 |
| 749.84 | 0.00 | 0.00 | 0.00 | 750.86 | 5.86 | 4.91 | 0.95 |
| 749.86 | 0.00 | 0.00 | 0.00 | 750.88 | 6.15 | 4.92 | 1.23 |
| 749.88 | 0.00 | 0.00 | 0.00 | 750.90 | 6.46 | 4.94 | 1.52 |
| 749.90 | 0.00 | 0.00 | 0.00 | 750.92 | 6.79 | 4.96 | 1.83 |
| 749.92 | 0.00 | 0.00 | 0.00 | 750.94 | 7.15 | 4.98 | 2.17 |
| 749.94 | 0.00 | 0.00 | 0.00 | 750.96 | 7.52 | 5.00 | 2.52 |
| 749.96 | 0.00 | 0.00 | 0.00 | 750.98 | 7.90 | 5.02 | 2.89 |
| 749.98 | 0.00 | 0.00 | 0.00 | 751.00 | 8.31 | 5.04 | 3.27 |
| 750.00 | 0.00 | 0.00 | 0.00 | 751.02 | 8.82 | 5.15 | 3.67 |
| 750.02 | 0.07 | 0.07 | 0.00 | 751.04 | 9.42 | 5.33 | 4.09 |
| 750.04 | 0.21 | 0.21 | 0.00 | 751.06 | 10.08 | 5.57 | 4.52 |
| 750.06 | 0.38 | 0.38 | 0.00 | 751.08 | 10.81 | 5.85 | 4.96 |
| 750.08 | 0.59 | 0.59 | 0.00 | 751.10 | 11.57 | 6.16 | 5.42 |
| 750.10 | 0.83 | 0.83 | 0.00 | 751.12 | 12.39 | 6.50 | 5.89 |
| 750.12 | 1.09 | 1.09 | 0.00 | 751.14 | 13.24 | 6.87 | 6.37 |
| 750.14 | 1.37 | 1.37 | 0.00 | 751.16 | 14.13 | 7.27 | 6.87 |
| 750.16 | 1.67 | 1.67 | 0.00 | 751.18 | 15.06 | 7.69 | 7.38 |
| 750.18 | 2.00 | 2.00 | 0.00 | 751.20 | 16.02 | 8.13 | 7.90 |
| 750.20 | 2.34 | 2.34 | 0.00 | 751.22 | 16.81 | 8.59 | 8.22 |
| 750.22 | 2.70 | 2.70 | 0.00 | 751.24 | 17.31 | 9.08 | 8.23 |
| 750.24 | 3.08 | 3.08 | 0.00 | 751.26 | 17.83 | 9.58 | 8.25 |
| 750.26 | 3.47 | 3.47 | 0.00 | 751.28 | 18.37 | 10.10 | 8.27 |
| 750.28 | 3.88 | 3.88 | 0.00 | 751.30 | 18.93 | 10.64 | 8.29 |
| 750.30 | 4.30 | 4.30 | 0.00 | 751.32 | 19.50 | 11.20 | 8.30 |
| 750.32 | 4.37 | 4.37 | 0.00 | 751.34 | 20.10 | 11.78 | 8.32 |
| 750.34 | 4.39 | 4.39 | 0.00 | 751.36 | 20.70 | 12.37 | 8.34 |
| 750.36 | 4.41 | 4.41 | 0.00 | 751.38 | 21.33 | 12.97 | 8.35 |
| 750.38 | 4.43 | 4.43 | 0.00 | 751.40 | 21.97 | 13.60 | 8.37 |
| 750.40 | 4.45 | 4.45 | 0.00 | 751.42 | 22.62 | 14.23 | 8.39 |
| 750.42 | 4.47 | 4.47 | 0.00 | 751.44 | 23.29 | 14.88 | 8.41 |
| 750.44 | 4.49 | 4.49 | 0.00 | 751.46 | 23.97 | 15.55 | 8.42 |
| 750.46 | 4.51 | 4.51 | 0.00 | 751.48 | 24.67 | 16.23 | 8.44 |
| 750.48 | 4.53 | 4.53 | 0.00 | 751.50 | 25.38 | 16.92 | 8.46 |
| 750.50 | 4.55 | 4.55 | 0.00 | | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Stage-Area-Storage for Pond B-2: Bioretention B-2

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 749.50 | 15,000 | 0 | 750.52 | 22,650 | 19,201 |
| 749.52 | 15,150 | 301 | 750.54 | 22,800 | 19,656 |
| 749.54 | 15,300 | 606 | 750.56 | 22,950 | 20,113 |
| 749.56 | 15,450 | 913 | 750.58 | 23,100 | 20,574 |
| 749.58 | 15,600 | 1,224 | 750.60 | 23,250 | 21,038 |
| 749.60 | 15,750 | 1,538 | 750.62 | 23,400 | 21,504 |
| 749.62 | 15,900 | 1,854 | 750.64 | 23,550 | 21,973 |
| 749.64 | 16,050 | 2,173 | 750.66 | 23,700 | 22,446 |
| 749.66 | 16,200 | 2,496 | 750.68 | 23,850 | 22,921 |
| 749.68 | 16,350 | 2,821 | 750.70 | 24,000 | 23,400 |
| 749.70 | 16,500 | 3,150 | 750.72 | 24,150 | 23,882 |
| 749.72 | 16,650 | 3,482 | 750.74 | 24,300 | 24,366 |
| 749.74 | 16,800 | 3,816 | 750.76 | 24,450 | 24,853 |
| 749.76 | 16,950 | 4,153 | 750.78 | 24,600 | 25,344 |
| 749.78 | 17,100 | 4,494 | 750.80 | 24,750 | 25,837 |
| 749.80 | 17,250 | 4,837 | 750.82 | 24,900 | 26,334 |
| 749.82 | 17,400 | 5,184 | 750.84 | 25,050 | 26,834 |
| 749.84 | 17,550 | 5,534 | 750.86 | 25,200 | 27,336 |
| 749.86 | 17,700 | 5,886 | 750.88 | 25,350 | 27,841 |
| 749.88 | 17,850 | 6,241 | 750.90 | 25,500 | 28,350 |
| 749.90 | 18,000 | 6,600 | 750.92 | 25,650 | 28,861 |
| 749.92 | 18,150 | 6,961 | 750.94 | 25,800 | 29,376 |
| 749.94 | 18,300 | 7,326 | 750.96 | 25,950 | 29,894 |
| 749.96 | 18,450 | 7,694 | 750.98 | 26,100 | 30,414 |
| 749.98 | 18,600 | 8,064 | 751.00 | 26,250 | 30,938 |
| 750.00 | 18,750 | 8,438 | 751.02 | 26,400 | 31,464 |
| 750.02 | 18,900 | 8,814 | 751.04 | 26,550 | 31,993 |
| 750.04 | 19,050 | 9,193 | 751.06 | 26,700 | 32,526 |
| 750.06 | 19,200 | 9,576 | 751.08 | 26,850 | 33,062 |
| 750.08 | 19,350 | 9,962 | 751.10 | 27,000 | 33,600 |
| 750.10 | 19,500 | 10,350 | 751.12 | 27,150 | 34,142 |
| 750.12 | 19,650 | 10,742 | 751.14 | 27,300 | 34,686 |
| 750.14 | 19,800 | 11,136 | 751.16 | 27,450 | 35,233 |
| 750.16 | 19,950 | 11,533 | 751.18 | 27,600 | 35,784 |
| 750.18 | 20,100 | 11,934 | 751.20 | 27,750 | 36,338 |
| 750.20 | 20,250 | 12,338 | 751.22 | 27,900 | 36,894 |
| 750.22 | 20,400 | 12,744 | 751.24 | 28,050 | 37,454 |
| 750.24 | 20,550 | 13,154 | 751.26 | 28,200 | 38,016 |
| 750.26 | 20,700 | 13,566 | 751.28 | 28,350 | 38,581 |
| 750.28 | 20,850 | 13,981 | 751.30 | 28,500 | 39,150 |
| 750.30 | 21,000 | 14,400 | 751.32 | 28,650 | 39,722 |
| 750.32 | 21,150 | 14,822 | 751.34 | 28,800 | 40,296 |
| 750.34 | 21,300 | 15,246 | 751.36 | 28,950 | 40,874 |
| 750.36 | 21,450 | 15,674 | 751.38 | 29,100 | 41,454 |
| 750.38 | 21,600 | 16,104 | 751.40 | 29,250 | 42,037 |
| 750.40 | 21,750 | 16,537 | 751.42 | 29,400 | 42,624 |
| 750.42 | 21,900 | 16,974 | 751.44 | 29,550 | 43,214 |
| 750.44 | 22,050 | 17,414 | 751.46 | 29,700 | 43,806 |
| 750.46 | 22,200 | 17,856 | 751.48 | 29,850 | 44,402 |
| 750.48 | 22,350 | 18,302 | 751.50 | 30,000 | 45,000 |
| 750.50 | 22,500 | 18,750 | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Pond B-3: Bioretention B-3

Inflow Area = 5.321 ac, 76.83% Impervious, Inflow Depth = 3.20" for 25-yr event
 Inflow = 26.84 cfs @ 11.96 hrs, Volume= 1.418 af
 Outflow = 6.03 cfs @ 12.13 hrs, Volume= 1.263 af, Atten= 78%, Lag= 10.3 min
 Primary = 6.03 cfs @ 12.13 hrs, Volume= 1.263 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Peak Elev= 751.67' @ 12.13 hrs Surf.Area= 22,034 sf Storage= 28,458 cf

Plug-Flow detention time= 138.2 min calculated for 1.263 af (89% of inflow)
 Center-of-Mass det. time= 82.7 min (860.4 - 777.7)

| Volume | Invert | Avail.Storage | Storage Description |
|---------------------|----------------------|---------------------------|--|
| #1 | 750.00' | 36,000 cf | Surf. Storage (Prismatic) Listed below (Recalc) |
| | | | |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 750.00 | 12,000 | 0 | 0 |
| 752.00 | 24,000 | 36,000 | 36,000 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|---------|--|
| #1 | Primary | 746.50' | 8.0" Round Culvert-Primary L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 746.50' / 746.00' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf |
| #2 | Device 1 | 750.50' | 24.0" x 24.0" Horiz. Grate-Primary C= 0.600 Limited to weir flow at low heads |
| #3 | Primary | 751.50' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=5.99 cfs @ 12.13 hrs HW=751.67' TW=0.00' (Dynamic Tailwater)

- 1=Culvert-Primary (Barrel Controls 3.69 cfs @ 10.58 fps)
- 2=Grate-Primary (Passes 3.69 cfs of 20.84 cfs potential flow)
- 3=Sharp-Crested Rectangular Weir (Weir Controls 2.30 cfs @ 1.35 fps)

Proposed Conditions I

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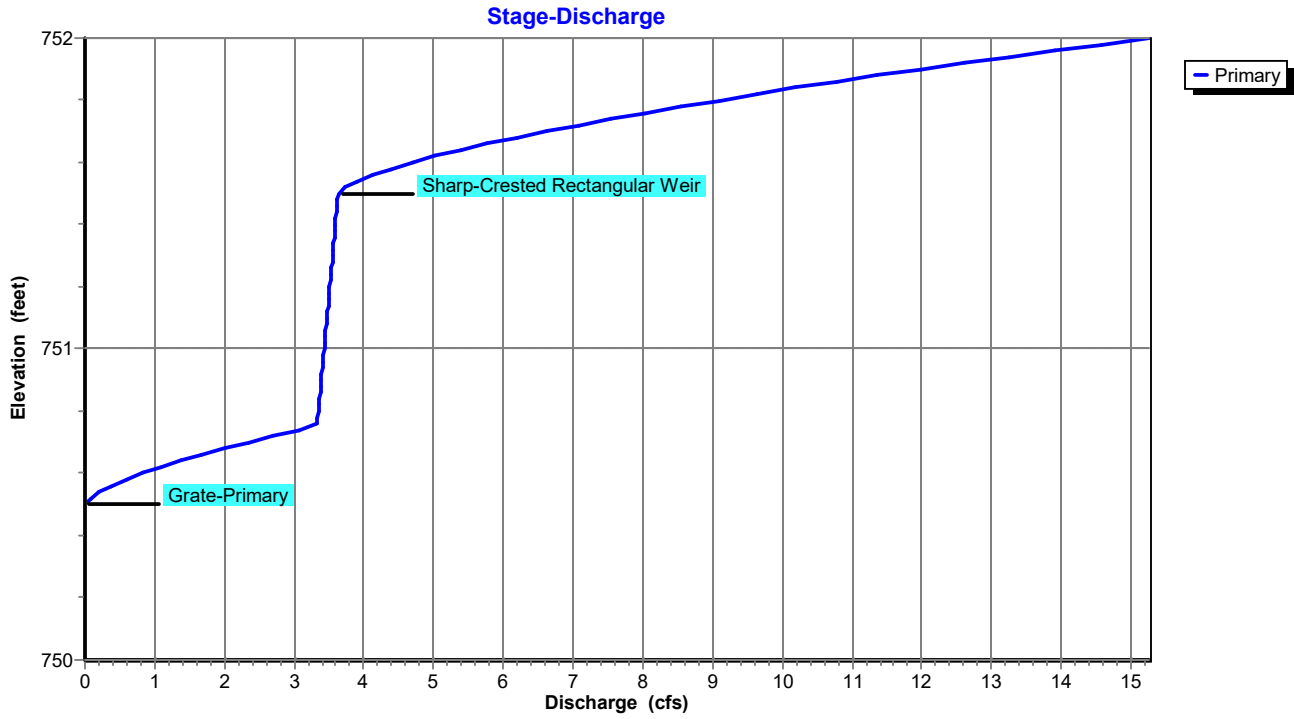
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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

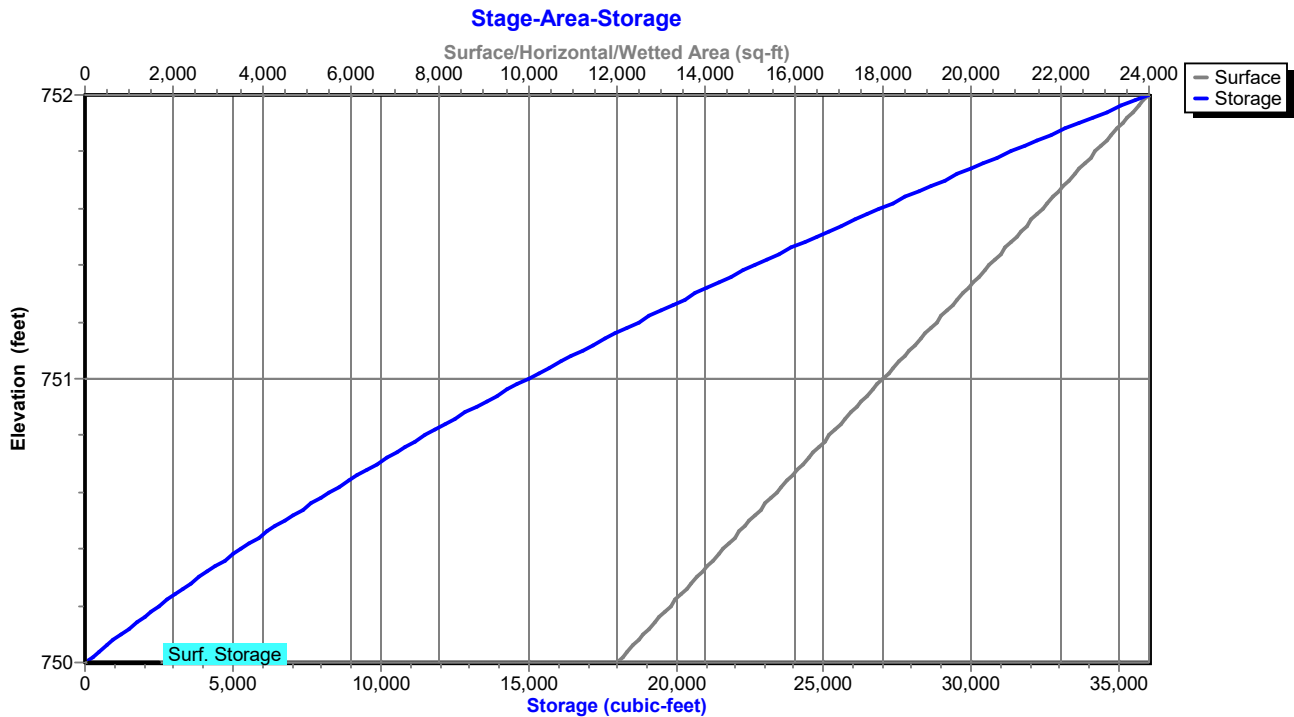
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Pond B-3: Bioretention B-3



Pond B-3: Bioretention B-3



Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Stage-Discharge for Pond B-3: Bioretention B-3

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|
| 750.00 | 0.00 | 750.51 | 0.03 | 751.02 | 3.44 | 751.53 | 3.81 |
| 750.01 | 0.00 | 750.52 | 0.07 | 751.03 | 3.44 | 751.54 | 3.91 |
| 750.02 | 0.00 | 750.53 | 0.14 | 751.04 | 3.45 | 751.55 | 4.01 |
| 750.03 | 0.00 | 750.54 | 0.21 | 751.05 | 3.45 | 751.56 | 4.13 |
| 750.04 | 0.00 | 750.55 | 0.29 | 751.06 | 3.46 | 751.57 | 4.26 |
| 750.05 | 0.00 | 750.56 | 0.38 | 751.07 | 3.46 | 751.58 | 4.40 |
| 750.06 | 0.00 | 750.57 | 0.48 | 751.08 | 3.46 | 751.59 | 4.55 |
| 750.07 | 0.00 | 750.58 | 0.59 | 751.09 | 3.47 | 751.60 | 4.70 |
| 750.08 | 0.00 | 750.59 | 0.71 | 751.10 | 3.47 | 751.61 | 4.86 |
| 750.09 | 0.00 | 750.60 | 0.83 | 751.11 | 3.48 | 751.62 | 5.03 |
| 750.10 | 0.00 | 750.61 | 0.95 | 751.12 | 3.48 | 751.63 | 5.21 |
| 750.11 | 0.00 | 750.62 | 1.09 | 751.13 | 3.48 | 751.64 | 5.39 |
| 750.12 | 0.00 | 750.63 | 1.23 | 751.14 | 3.49 | 751.65 | 5.58 |
| 750.13 | 0.00 | 750.64 | 1.37 | 751.15 | 3.49 | 751.66 | 5.78 |
| 750.14 | 0.00 | 750.65 | 1.52 | 751.16 | 3.50 | 751.67 | 5.98 |
| 750.15 | 0.00 | 750.66 | 1.67 | 751.17 | 3.50 | 751.68 | 6.19 |
| 750.16 | 0.00 | 750.67 | 1.83 | 751.18 | 3.50 | 751.69 | 6.40 |
| 750.17 | 0.00 | 750.68 | 2.00 | 751.19 | 3.51 | 751.70 | 6.62 |
| 750.18 | 0.00 | 750.69 | 2.17 | 751.20 | 3.51 | 751.71 | 6.84 |
| 750.19 | 0.00 | 750.70 | 2.34 | 751.21 | 3.52 | 751.72 | 7.07 |
| 750.20 | 0.00 | 750.71 | 2.52 | 751.22 | 3.52 | 751.73 | 7.31 |
| 750.21 | 0.00 | 750.72 | 2.70 | 751.23 | 3.52 | 751.74 | 7.55 |
| 750.22 | 0.00 | 750.73 | 2.89 | 751.24 | 3.53 | 751.75 | 7.79 |
| 750.23 | 0.00 | 750.74 | 3.08 | 751.25 | 3.53 | 751.76 | 8.04 |
| 750.24 | 0.00 | 750.75 | 3.27 | 751.26 | 3.54 | 751.77 | 8.29 |
| 750.25 | 0.00 | 750.76 | 3.33 | 751.27 | 3.54 | 751.78 | 8.55 |
| 750.26 | 0.00 | 750.77 | 3.33 | 751.28 | 3.54 | 751.79 | 8.81 |
| 750.27 | 0.00 | 750.78 | 3.34 | 751.29 | 3.55 | 751.80 | 9.08 |
| 750.28 | 0.00 | 750.79 | 3.34 | 751.30 | 3.55 | 751.81 | 9.35 |
| 750.29 | 0.00 | 750.80 | 3.35 | 751.31 | 3.56 | 751.82 | 9.63 |
| 750.30 | 0.00 | 750.81 | 3.35 | 751.32 | 3.56 | 751.83 | 9.91 |
| 750.31 | 0.00 | 750.82 | 3.36 | 751.33 | 3.56 | 751.84 | 10.19 |
| 750.32 | 0.00 | 750.83 | 3.36 | 751.34 | 3.57 | 751.85 | 10.48 |
| 750.33 | 0.00 | 750.84 | 3.36 | 751.35 | 3.57 | 751.86 | 10.78 |
| 750.34 | 0.00 | 750.85 | 3.37 | 751.36 | 3.58 | 751.87 | 11.07 |
| 750.35 | 0.00 | 750.86 | 3.37 | 751.37 | 3.58 | 751.88 | 11.37 |
| 750.36 | 0.00 | 750.87 | 3.38 | 751.38 | 3.58 | 751.89 | 11.68 |
| 750.37 | 0.00 | 750.88 | 3.38 | 751.39 | 3.59 | 751.90 | 11.98 |
| 750.38 | 0.00 | 750.89 | 3.39 | 751.40 | 3.59 | 751.91 | 12.30 |
| 750.39 | 0.00 | 750.90 | 3.39 | 751.41 | 3.60 | 751.92 | 12.61 |
| 750.40 | 0.00 | 750.91 | 3.39 | 751.42 | 3.60 | 751.93 | 12.93 |
| 750.41 | 0.00 | 750.92 | 3.40 | 751.43 | 3.60 | 751.94 | 13.25 |
| 750.42 | 0.00 | 750.93 | 3.40 | 751.44 | 3.61 | 751.95 | 13.58 |
| 750.43 | 0.00 | 750.94 | 3.41 | 751.45 | 3.61 | 751.96 | 13.91 |
| 750.44 | 0.00 | 750.95 | 3.41 | 751.46 | 3.62 | 751.97 | 14.24 |
| 750.45 | 0.00 | 750.96 | 3.41 | 751.47 | 3.62 | 751.98 | 14.58 |
| 750.46 | 0.00 | 750.97 | 3.42 | 751.48 | 3.62 | 751.99 | 14.92 |
| 750.47 | 0.00 | 750.98 | 3.42 | 751.49 | 3.63 | 752.00 | 15.26 |
| 750.48 | 0.00 | 750.99 | 3.43 | 751.50 | 3.63 | | |
| 750.49 | 0.00 | 751.00 | 3.43 | 751.51 | 3.67 | | |
| 750.50 | 0.00 | 751.01 | 3.43 | 751.52 | 3.73 | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Stage-Area-Storage for Pond B-3: Bioretention B-3

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 750.00 | 12,000 | 0 | 751.02 | 18,120 | 15,361 |
| 750.02 | 12,120 | 241 | 751.04 | 18,240 | 15,725 |
| 750.04 | 12,240 | 485 | 751.06 | 18,360 | 16,091 |
| 750.06 | 12,360 | 731 | 751.08 | 18,480 | 16,459 |
| 750.08 | 12,480 | 979 | 751.10 | 18,600 | 16,830 |
| 750.10 | 12,600 | 1,230 | 751.12 | 18,720 | 17,203 |
| 750.12 | 12,720 | 1,483 | 751.14 | 18,840 | 17,579 |
| 750.14 | 12,840 | 1,739 | 751.16 | 18,960 | 17,957 |
| 750.16 | 12,960 | 1,997 | 751.18 | 19,080 | 18,337 |
| 750.18 | 13,080 | 2,257 | 751.20 | 19,200 | 18,720 |
| 750.20 | 13,200 | 2,520 | 751.22 | 19,320 | 19,105 |
| 750.22 | 13,320 | 2,785 | 751.24 | 19,440 | 19,493 |
| 750.24 | 13,440 | 3,053 | 751.26 | 19,560 | 19,883 |
| 750.26 | 13,560 | 3,323 | 751.28 | 19,680 | 20,275 |
| 750.28 | 13,680 | 3,595 | 751.30 | 19,800 | 20,670 |
| 750.30 | 13,800 | 3,870 | 751.32 | 19,920 | 21,067 |
| 750.32 | 13,920 | 4,147 | 751.34 | 20,040 | 21,467 |
| 750.34 | 14,040 | 4,427 | 751.36 | 20,160 | 21,869 |
| 750.36 | 14,160 | 4,709 | 751.38 | 20,280 | 22,273 |
| 750.38 | 14,280 | 4,993 | 751.40 | 20,400 | 22,680 |
| 750.40 | 14,400 | 5,280 | 751.42 | 20,520 | 23,089 |
| 750.42 | 14,520 | 5,569 | 751.44 | 20,640 | 23,501 |
| 750.44 | 14,640 | 5,861 | 751.46 | 20,760 | 23,915 |
| 750.46 | 14,760 | 6,155 | 751.48 | 20,880 | 24,331 |
| 750.48 | 14,880 | 6,451 | 751.50 | 21,000 | 24,750 |
| 750.50 | 15,000 | 6,750 | 751.52 | 21,120 | 25,171 |
| 750.52 | 15,120 | 7,051 | 751.54 | 21,240 | 25,595 |
| 750.54 | 15,240 | 7,355 | 751.56 | 21,360 | 26,021 |
| 750.56 | 15,360 | 7,661 | 751.58 | 21,480 | 26,449 |
| 750.58 | 15,480 | 7,969 | 751.60 | 21,600 | 26,880 |
| 750.60 | 15,600 | 8,280 | 751.62 | 21,720 | 27,313 |
| 750.62 | 15,720 | 8,593 | 751.64 | 21,840 | 27,749 |
| 750.64 | 15,840 | 8,909 | 751.66 | 21,960 | 28,187 |
| 750.66 | 15,960 | 9,227 | 751.68 | 22,080 | 28,627 |
| 750.68 | 16,080 | 9,547 | 751.70 | 22,200 | 29,070 |
| 750.70 | 16,200 | 9,870 | 751.72 | 22,320 | 29,515 |
| 750.72 | 16,320 | 10,195 | 751.74 | 22,440 | 29,963 |
| 750.74 | 16,440 | 10,523 | 751.76 | 22,560 | 30,413 |
| 750.76 | 16,560 | 10,853 | 751.78 | 22,680 | 30,865 |
| 750.78 | 16,680 | 11,185 | 751.80 | 22,800 | 31,320 |
| 750.80 | 16,800 | 11,520 | 751.82 | 22,920 | 31,777 |
| 750.82 | 16,920 | 11,857 | 751.84 | 23,040 | 32,237 |
| 750.84 | 17,040 | 12,197 | 751.86 | 23,160 | 32,699 |
| 750.86 | 17,160 | 12,539 | 751.88 | 23,280 | 33,163 |
| 750.88 | 17,280 | 12,883 | 751.90 | 23,400 | 33,630 |
| 750.90 | 17,400 | 13,230 | 751.92 | 23,520 | 34,099 |
| 750.92 | 17,520 | 13,579 | 751.94 | 23,640 | 34,571 |
| 750.94 | 17,640 | 13,931 | 751.96 | 23,760 | 35,045 |
| 750.96 | 17,760 | 14,285 | 751.98 | 23,880 | 35,521 |
| 750.98 | 17,880 | 14,641 | 752.00 | 24,000 | 36,000 |
| 751.00 | 18,000 | 15,000 | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Pond B-4: Bioretention B-4

Inflow Area = 2.572 ac, 78.93% Impervious, Inflow Depth = 3.20" for 25-yr event
Inflow = 12.97 cfs @ 11.96 hrs, Volume= 0.685 af
Outflow = 5.96 cfs @ 12.07 hrs, Volume= 0.613 af, Atten= 54%, Lag= 6.5 min
Primary = 5.96 cfs @ 12.07 hrs, Volume= 0.613 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 754.33' @ 12.07 hrs Surf.Area= 7,334 sf Storage= 8,896 cf

Plug-Flow detention time= 99.9 min calculated for 0.613 af (90% of inflow)
Center-of-Mass det. time= 46.0 min (823.7 - 777.7)

| Volume | Invert | Avail.Storage | Storage Description |
|---------------------|----------------------|---------------------------|--|
| #1 | 753.00' | 14,000 cf | Surf. Storage (Prismatic) Listed below (Recalc) |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 753.00 | 6,000 | 0 | 0 |
| 755.00 | 8,000 | 14,000 | 14,000 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|---------|--|
| #1 | Primary | 749.50' | 12.0" Round Culvert-Primary L= 230.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 749.50' / 746.50' S= 0.0130 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf |
| #2 | Device 1 | 753.50' | 24.0" x 24.0" Horiz. Grate-Primary C= 0.600 Limited to weir flow at low heads |
| #3 | Primary | 754.50' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=5.95 cfs @ 12.07 hrs HW=754.32' TW=0.00' (Dynamic Tailwater)

- 1=Culvert-Primary (Barrel Controls 5.95 cfs @ 7.58 fps)
- 2=Grate-Primary (Passes 5.95 cfs of 17.46 cfs potential flow)
- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Proposed Conditions I

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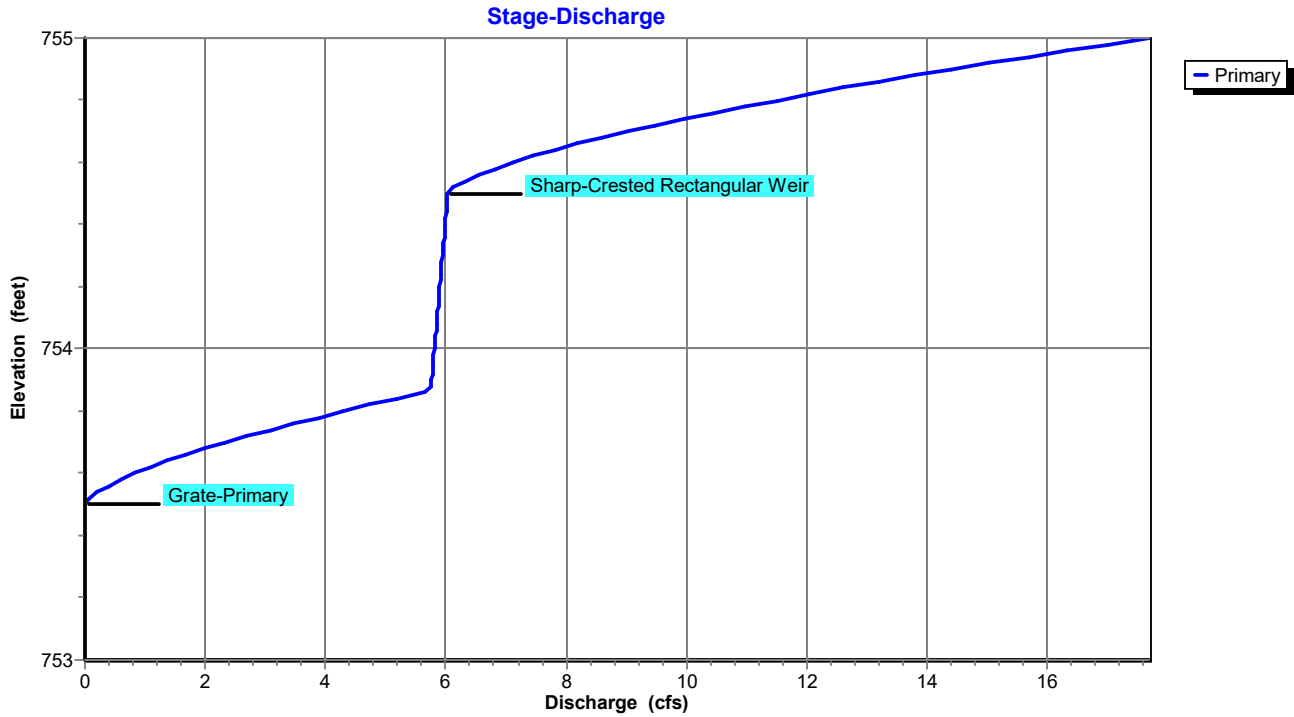
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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

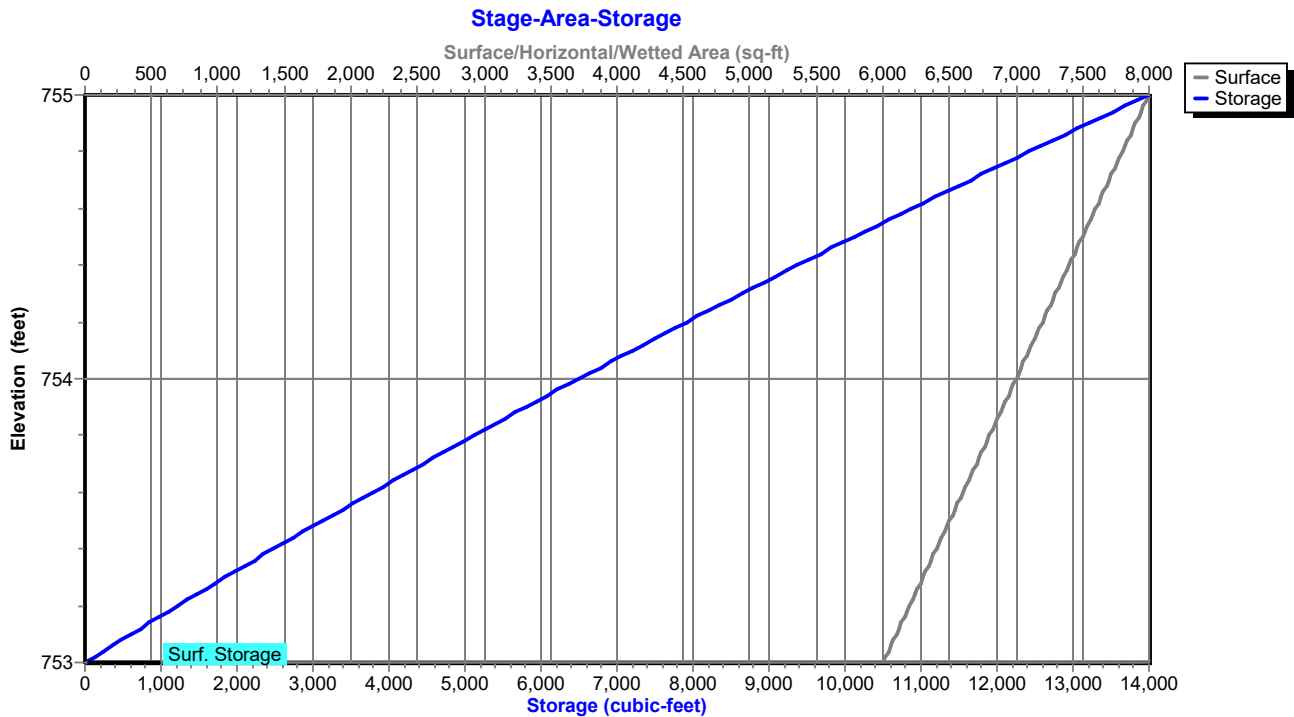
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Pond B-4: Bioretention B-4



Pond B-4: Bioretention B-4



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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Stage-Discharge for Pond B-4: Bioretention B-4

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|
| 753.00 | 0.00 | 753.51 | 0.03 | 754.02 | 5.82 | 754.53 | 6.21 |
| 753.01 | 0.00 | 753.52 | 0.07 | 754.03 | 5.82 | 754.54 | 6.31 |
| 753.02 | 0.00 | 753.53 | 0.14 | 754.04 | 5.83 | 754.55 | 6.41 |
| 753.03 | 0.00 | 753.54 | 0.21 | 754.05 | 5.83 | 754.56 | 6.53 |
| 753.04 | 0.00 | 753.55 | 0.29 | 754.06 | 5.84 | 754.57 | 6.66 |
| 753.05 | 0.00 | 753.56 | 0.38 | 754.07 | 5.84 | 754.58 | 6.80 |
| 753.06 | 0.00 | 753.57 | 0.48 | 754.08 | 5.84 | 754.59 | 6.95 |
| 753.07 | 0.00 | 753.58 | 0.59 | 754.09 | 5.85 | 754.60 | 7.10 |
| 753.08 | 0.00 | 753.59 | 0.71 | 754.10 | 5.85 | 754.61 | 7.27 |
| 753.09 | 0.00 | 753.60 | 0.83 | 754.11 | 5.86 | 754.62 | 7.44 |
| 753.10 | 0.00 | 753.61 | 0.95 | 754.12 | 5.86 | 754.63 | 7.61 |
| 753.11 | 0.00 | 753.62 | 1.09 | 754.13 | 5.87 | 754.64 | 7.80 |
| 753.12 | 0.00 | 753.63 | 1.23 | 754.14 | 5.87 | 754.65 | 7.99 |
| 753.13 | 0.00 | 753.64 | 1.37 | 754.15 | 5.88 | 754.66 | 8.18 |
| 753.14 | 0.00 | 753.65 | 1.52 | 754.16 | 5.88 | 754.67 | 8.38 |
| 753.15 | 0.00 | 753.66 | 1.67 | 754.17 | 5.88 | 754.68 | 8.59 |
| 753.16 | 0.00 | 753.67 | 1.83 | 754.18 | 5.89 | 754.69 | 8.81 |
| 753.17 | 0.00 | 753.68 | 2.00 | 754.19 | 5.89 | 754.70 | 9.03 |
| 753.18 | 0.00 | 753.69 | 2.17 | 754.20 | 5.90 | 754.71 | 9.25 |
| 753.19 | 0.00 | 753.70 | 2.34 | 754.21 | 5.90 | 754.72 | 9.48 |
| 753.20 | 0.00 | 753.71 | 2.52 | 754.22 | 5.91 | 754.73 | 9.72 |
| 753.21 | 0.00 | 753.72 | 2.70 | 754.23 | 5.91 | 754.74 | 9.96 |
| 753.22 | 0.00 | 753.73 | 2.89 | 754.24 | 5.91 | 754.75 | 10.20 |
| 753.23 | 0.00 | 753.74 | 3.08 | 754.25 | 5.92 | 754.76 | 10.45 |
| 753.24 | 0.00 | 753.75 | 3.27 | 754.26 | 5.92 | 754.77 | 10.71 |
| 753.25 | 0.00 | 753.76 | 3.47 | 754.27 | 5.93 | 754.78 | 10.96 |
| 753.26 | 0.00 | 753.77 | 3.67 | 754.28 | 5.93 | 754.79 | 11.23 |
| 753.27 | 0.00 | 753.78 | 3.88 | 754.29 | 5.94 | 754.80 | 11.50 |
| 753.28 | 0.00 | 753.79 | 4.09 | 754.30 | 5.94 | 754.81 | 11.77 |
| 753.29 | 0.00 | 753.80 | 4.30 | 754.31 | 5.95 | 754.82 | 12.05 |
| 753.30 | 0.00 | 753.81 | 4.52 | 754.32 | 5.95 | 754.83 | 12.33 |
| 753.31 | 0.00 | 753.82 | 4.74 | 754.33 | 5.95 | 754.84 | 12.61 |
| 753.32 | 0.00 | 753.83 | 4.96 | 754.34 | 5.96 | 754.85 | 12.90 |
| 753.33 | 0.00 | 753.84 | 5.19 | 754.35 | 5.96 | 754.86 | 13.19 |
| 753.34 | 0.00 | 753.85 | 5.42 | 754.36 | 5.97 | 754.87 | 13.49 |
| 753.35 | 0.00 | 753.86 | 5.65 | 754.37 | 5.97 | 754.88 | 13.79 |
| 753.36 | 0.00 | 753.87 | 5.75 | 754.38 | 5.98 | 754.89 | 14.10 |
| 753.37 | 0.00 | 753.88 | 5.75 | 754.39 | 5.98 | 754.90 | 14.40 |
| 753.38 | 0.00 | 753.89 | 5.76 | 754.40 | 5.98 | 754.91 | 14.72 |
| 753.39 | 0.00 | 753.90 | 5.76 | 754.41 | 5.99 | 754.92 | 15.03 |
| 753.40 | 0.00 | 753.91 | 5.77 | 754.42 | 5.99 | 754.93 | 15.35 |
| 753.41 | 0.00 | 753.92 | 5.77 | 754.43 | 6.00 | 754.94 | 15.67 |
| 753.42 | 0.00 | 753.93 | 5.78 | 754.44 | 6.00 | 754.95 | 16.00 |
| 753.43 | 0.00 | 753.94 | 5.78 | 754.45 | 6.01 | 754.96 | 16.33 |
| 753.44 | 0.00 | 753.95 | 5.79 | 754.46 | 6.01 | 754.97 | 16.66 |
| 753.45 | 0.00 | 753.96 | 5.79 | 754.47 | 6.01 | 754.98 | 17.00 |
| 753.46 | 0.00 | 753.97 | 5.80 | 754.48 | 6.02 | 754.99 | 17.34 |
| 753.47 | 0.00 | 753.98 | 5.80 | 754.49 | 6.02 | 755.00 | 17.68 |
| 753.48 | 0.00 | 753.99 | 5.80 | 754.50 | 6.03 | | |
| 753.49 | 0.00 | 754.00 | 5.81 | 754.51 | 6.06 | | |
| 753.50 | 0.00 | 754.01 | 5.81 | 754.52 | 6.13 | | |

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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Stage-Area-Storage for Pond B-4: Bioretention B-4

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 753.00 | 6,000 | 0 | 754.02 | 7,020 | 6,640 |
| 753.02 | 6,020 | 120 | 754.04 | 7,040 | 6,781 |
| 753.04 | 6,040 | 241 | 754.06 | 7,060 | 6,922 |
| 753.06 | 6,060 | 362 | 754.08 | 7,080 | 7,063 |
| 753.08 | 6,080 | 483 | 754.10 | 7,100 | 7,205 |
| 753.10 | 6,100 | 605 | 754.12 | 7,120 | 7,347 |
| 753.12 | 6,120 | 727 | 754.14 | 7,140 | 7,490 |
| 753.14 | 6,140 | 850 | 754.16 | 7,160 | 7,633 |
| 753.16 | 6,160 | 973 | 754.18 | 7,180 | 7,776 |
| 753.18 | 6,180 | 1,096 | 754.20 | 7,200 | 7,920 |
| 753.20 | 6,200 | 1,220 | 754.22 | 7,220 | 8,064 |
| 753.22 | 6,220 | 1,344 | 754.24 | 7,240 | 8,209 |
| 753.24 | 6,240 | 1,469 | 754.26 | 7,260 | 8,354 |
| 753.26 | 6,260 | 1,594 | 754.28 | 7,280 | 8,499 |
| 753.28 | 6,280 | 1,719 | 754.30 | 7,300 | 8,645 |
| 753.30 | 6,300 | 1,845 | 754.32 | 7,320 | 8,791 |
| 753.32 | 6,320 | 1,971 | 754.34 | 7,340 | 8,938 |
| 753.34 | 6,340 | 2,098 | 754.36 | 7,360 | 9,085 |
| 753.36 | 6,360 | 2,225 | 754.38 | 7,380 | 9,232 |
| 753.38 | 6,380 | 2,352 | 754.40 | 7,400 | 9,380 |
| 753.40 | 6,400 | 2,480 | 754.42 | 7,420 | 9,528 |
| 753.42 | 6,420 | 2,608 | 754.44 | 7,440 | 9,677 |
| 753.44 | 6,440 | 2,737 | 754.46 | 7,460 | 9,826 |
| 753.46 | 6,460 | 2,866 | 754.48 | 7,480 | 9,975 |
| 753.48 | 6,480 | 2,995 | 754.50 | 7,500 | 10,125 |
| 753.50 | 6,500 | 3,125 | 754.52 | 7,520 | 10,275 |
| 753.52 | 6,520 | 3,255 | 754.54 | 7,540 | 10,426 |
| 753.54 | 6,540 | 3,386 | 754.56 | 7,560 | 10,577 |
| 753.56 | 6,560 | 3,517 | 754.58 | 7,580 | 10,728 |
| 753.58 | 6,580 | 3,648 | 754.60 | 7,600 | 10,880 |
| 753.60 | 6,600 | 3,780 | 754.62 | 7,620 | 11,032 |
| 753.62 | 6,620 | 3,912 | 754.64 | 7,640 | 11,185 |
| 753.64 | 6,640 | 4,045 | 754.66 | 7,660 | 11,338 |
| 753.66 | 6,660 | 4,178 | 754.68 | 7,680 | 11,491 |
| 753.68 | 6,680 | 4,311 | 754.70 | 7,700 | 11,645 |
| 753.70 | 6,700 | 4,445 | 754.72 | 7,720 | 11,799 |
| 753.72 | 6,720 | 4,579 | 754.74 | 7,740 | 11,954 |
| 753.74 | 6,740 | 4,714 | 754.76 | 7,760 | 12,109 |
| 753.76 | 6,760 | 4,849 | 754.78 | 7,780 | 12,264 |
| 753.78 | 6,780 | 4,984 | 754.80 | 7,800 | 12,420 |
| 753.80 | 6,800 | 5,120 | 754.82 | 7,820 | 12,576 |
| 753.82 | 6,820 | 5,256 | 754.84 | 7,840 | 12,733 |
| 753.84 | 6,840 | 5,393 | 754.86 | 7,860 | 12,890 |
| 753.86 | 6,860 | 5,530 | 754.88 | 7,880 | 13,047 |
| 753.88 | 6,880 | 5,667 | 754.90 | 7,900 | 13,205 |
| 753.90 | 6,900 | 5,805 | 754.92 | 7,920 | 13,363 |
| 753.92 | 6,920 | 5,943 | 754.94 | 7,940 | 13,522 |
| 753.94 | 6,940 | 6,082 | 754.96 | 7,960 | 13,681 |
| 753.96 | 6,960 | 6,221 | 754.98 | 7,980 | 13,840 |
| 753.98 | 6,980 | 6,360 | 755.00 | 8,000 | 14,000 |
| 754.00 | 7,000 | 6,500 | | | |

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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Pond P-1: Wet Pond P-1

Inflow Area = 22.268 ac, 71.72% Impervious, Inflow Depth = 2.68" for 25-yr event
 Inflow = 60.69 cfs @ 11.96 hrs, Volume= 4.967 af
 Outflow = 19.58 cfs @ 12.16 hrs, Volume= 4.959 af, Atten= 68%, Lag= 11.8 min
 Primary = 19.58 cfs @ 12.16 hrs, Volume= 4.959 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Peak Elev= 749.52' @ 12.16 hrs Surf.Area= 46,953 sf Storage= 72,491 cf

Plug-Flow detention time= 272.7 min calculated for 4.959 af (100% of inflow)
 Center-of-Mass det. time= 271.2 min (1,098.5 - 827.3)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|--|
| #1 | 740.00' | 0 cf | Retention (Irregular) Listed below (Recalc) 24,499 cf Overall x 0.0% Voids |
| #2 | 746.00' | 133,484 cf | Detention (Irregular) Listed below (Recalc) |
| | | 133,484 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|------------------|-------------------|---------------|------------------------|------------------------|------------------|
| 740.00 | 651 | 103.0 | 0 | 0 | 651 |
| 741.50 | 2,244 | 1,016.0 | 2,052 | 2,052 | 81,955 |
| 745.00 | 4,383 | 391.0 | 11,390 | 13,442 | 151,977 |
| 746.50 | 10,839 | 632.0 | 11,057 | 24,499 | 171,611 |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|------------------|-------------------|---------------|------------------------|------------------------|------------------|
| 746.00 | 11,459 | 563.0 | 0 | 0 | 11,459 |
| 747.00 | 13,760 | 587.0 | 12,592 | 12,592 | 13,729 |
| 748.00 | 19,120 | 930.0 | 16,367 | 28,959 | 55,143 |
| 749.00 | 32,528 | 1,810.0 | 25,529 | 54,488 | 247,025 |
| 750.00 | 39,522 | 1,836.0 | 35,968 | 90,456 | 254,786 |
| 751.00 | 46,632 | 1,863.0 | 43,028 | 133,484 | 262,946 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|---------|--|
| #1 | Primary | 742.25' | 30.0" Round Culvert L= 85.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 742.25' / 742.09' S= 0.0019 '/ Cc= 0.900 n= 0.012, Flow Area= 4.91 sf |
| #2 | Device 1 | 748.65' | 30.0" W x 30.0" H 9° Gate C= 0.600 Limited to weir flow at low heads |
| #3 | Primary | 749.65' | 20.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |
| #4 | Device 1 | 746.00' | 6.0" Round Culvert-Low Flow L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 745.50' / 746.00' S= -0.0333 '/ Cc= 0.900 n= 0.012, Flow Area= 0.20 sf |

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Type II 24-hr 25-yr Rainfall=3.87"

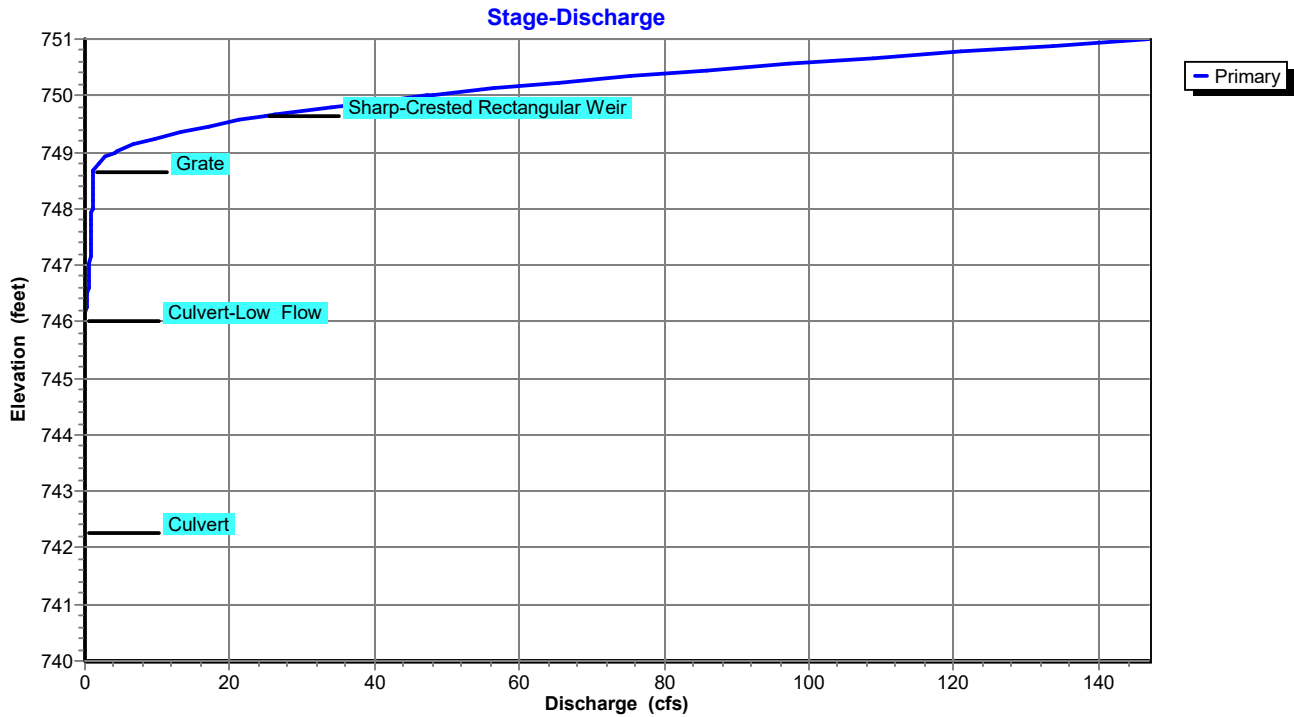
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Primary OutFlow Max=19.52 cfs @ 12.16 hrs HW=749.52' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 19.52 cfs of 58.01 cfs potential flow)
- 2=Gate (Weir Controls 18.17 cfs @ 2.70 fps)
- 4=Culvert-Low Flow (Inlet Controls 1.35 cfs @ 6.88 fps)
- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond P-1: Wet Pond P-1



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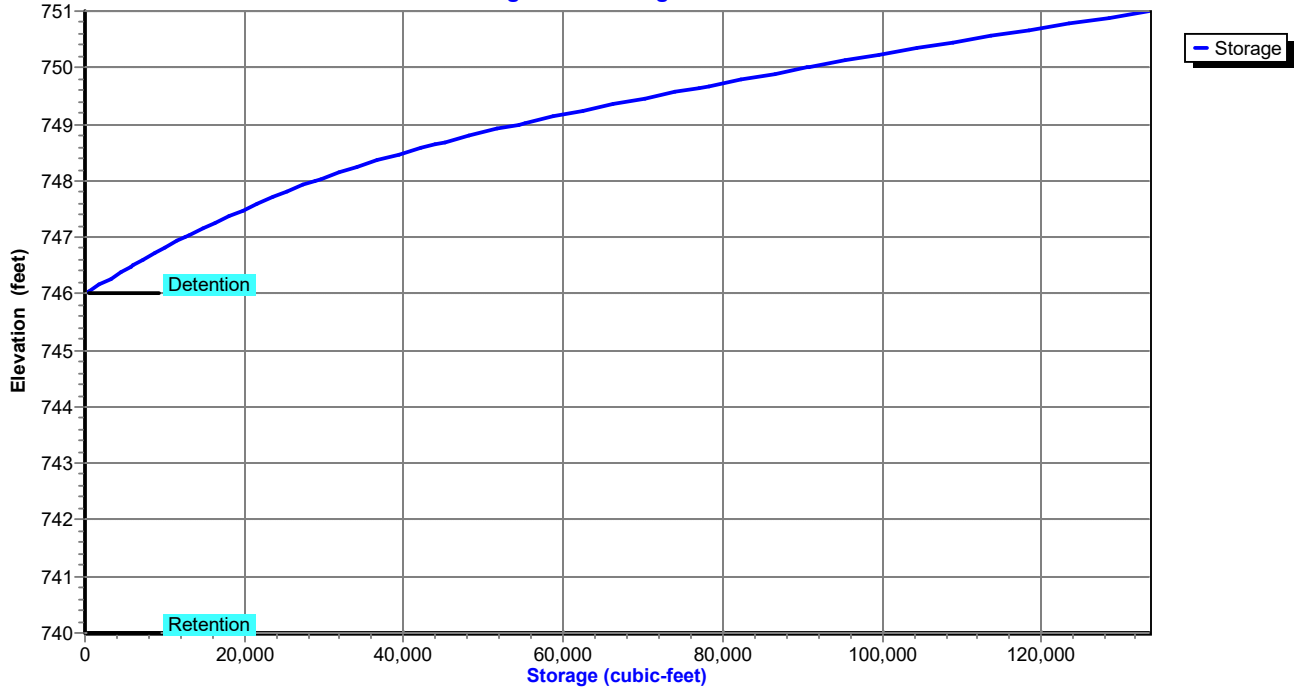
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Pond P-1: Wet Pond P-1

Stage-Area-Storage



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Type II 24-hr 25-yr Rainfall=3.87"

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Stage-Discharge for Pond P-1: Wet Pond P-1

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|
| 740.00 | 0.00 | 743.06 | 0.00 | 746.12 | 0.03 | 749.18 | 7.99 |
| 740.06 | 0.00 | 743.12 | 0.00 | 746.18 | 0.07 | 749.24 | 9.69 |
| 740.12 | 0.00 | 743.18 | 0.00 | 746.24 | 0.12 | 749.30 | 11.54 |
| 740.18 | 0.00 | 743.24 | 0.00 | 746.30 | 0.18 | 749.36 | 13.52 |
| 740.24 | 0.00 | 743.30 | 0.00 | 746.36 | 0.24 | 749.42 | 15.63 |
| 740.30 | 0.00 | 743.36 | 0.00 | 746.42 | 0.31 | 749.48 | 17.85 |
| 740.36 | 0.00 | 743.42 | 0.00 | 746.48 | 0.36 | 749.54 | 20.19 |
| 740.42 | 0.00 | 743.48 | 0.00 | 746.54 | 0.40 | 749.60 | 22.63 |
| 740.48 | 0.00 | 743.54 | 0.00 | 746.60 | 0.44 | 749.66 | 25.23 |
| 740.54 | 0.00 | 743.60 | 0.00 | 746.66 | 0.48 | 749.72 | 29.02 |
| 740.60 | 0.00 | 743.66 | 0.00 | 746.72 | 0.51 | 749.78 | 33.50 |
| 740.66 | 0.00 | 743.72 | 0.00 | 746.78 | 0.54 | 749.84 | 36.78 |
| 740.72 | 0.00 | 743.78 | 0.00 | 746.84 | 0.57 | 749.90 | 40.44 |
| 740.78 | 0.00 | 743.84 | 0.00 | 746.90 | 0.60 | 749.96 | 44.42 |
| 740.84 | 0.00 | 743.90 | 0.00 | 746.96 | 0.63 | 750.02 | 48.69 |
| 740.90 | 0.00 | 743.96 | 0.00 | 747.02 | 0.65 | 750.08 | 53.22 |
| 740.96 | 0.00 | 744.02 | 0.00 | 747.08 | 0.68 | 750.14 | 58.00 |
| 741.02 | 0.00 | 744.08 | 0.00 | 747.14 | 0.70 | 750.20 | 63.01 |
| 741.08 | 0.00 | 744.14 | 0.00 | 747.20 | 0.73 | 750.26 | 68.22 |
| 741.14 | 0.00 | 744.20 | 0.00 | 747.26 | 0.75 | 750.32 | 73.65 |
| 741.20 | 0.00 | 744.26 | 0.00 | 747.32 | 0.77 | 750.38 | 79.26 |
| 741.26 | 0.00 | 744.32 | 0.00 | 747.38 | 0.79 | 750.44 | 85.06 |
| 741.32 | 0.00 | 744.38 | 0.00 | 747.44 | 0.81 | 750.50 | 91.04 |
| 741.38 | 0.00 | 744.44 | 0.00 | 747.50 | 0.83 | 750.56 | 97.19 |
| 741.44 | 0.00 | 744.50 | 0.00 | 747.56 | 0.85 | 750.62 | 103.50 |
| 741.50 | 0.00 | 744.56 | 0.00 | 747.62 | 0.87 | 750.68 | 109.97 |
| 741.56 | 0.00 | 744.62 | 0.00 | 747.68 | 0.89 | 750.74 | 116.60 |
| 741.62 | 0.00 | 744.68 | 0.00 | 747.74 | 0.91 | 750.80 | 123.37 |
| 741.68 | 0.00 | 744.74 | 0.00 | 747.80 | 0.93 | 750.86 | 130.29 |
| 741.74 | 0.00 | 744.80 | 0.00 | 747.86 | 0.95 | 750.92 | 137.35 |
| 741.80 | 0.00 | 744.86 | 0.00 | 747.92 | 0.96 | 750.98 | 144.55 |
| 741.86 | 0.00 | 744.92 | 0.00 | 747.98 | 0.98 | | |
| 741.92 | 0.00 | 744.98 | 0.00 | 748.04 | 1.00 | | |
| 741.98 | 0.00 | 745.04 | 0.00 | 748.10 | 1.02 | | |
| 742.04 | 0.00 | 745.10 | 0.00 | 748.16 | 1.03 | | |
| 742.10 | 0.00 | 745.16 | 0.00 | 748.22 | 1.05 | | |
| 742.16 | 0.00 | 745.22 | 0.00 | 748.28 | 1.06 | | |
| 742.22 | 0.00 | 745.28 | 0.00 | 748.34 | 1.08 | | |
| 742.28 | 0.00 | 745.34 | 0.00 | 748.40 | 1.09 | | |
| 742.34 | 0.00 | 745.40 | 0.00 | 748.46 | 1.11 | | |
| 742.40 | 0.00 | 745.46 | 0.00 | 748.52 | 1.12 | | |
| 742.46 | 0.00 | 745.52 | 0.00 | 748.58 | 1.14 | | |
| 742.52 | 0.00 | 745.58 | 0.00 | 748.64 | 1.15 | | |
| 742.58 | 0.00 | 745.64 | 0.00 | 748.70 | 1.27 | | |
| 742.64 | 0.00 | 745.70 | 0.00 | 748.76 | 1.54 | | |
| 742.70 | 0.00 | 745.76 | 0.00 | 748.82 | 1.95 | | |
| 742.76 | 0.00 | 745.82 | 0.00 | 748.88 | 2.51 | | |
| 742.82 | 0.00 | 745.88 | 0.00 | 748.94 | 3.21 | | |
| 742.88 | 0.00 | 745.94 | 0.00 | 749.00 | 4.07 | | |
| 742.94 | 0.00 | 746.00 | 0.00 | 749.06 | 5.12 | | |
| 743.00 | 0.00 | 746.06 | 0.01 | 749.12 | 6.46 | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Stage-Area-Storage for Pond P-1: Wet Pond P-1

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---------------------|-------------------------|---------------------|-------------------------|
| 740.00 | 0 | 747.65 | 22,616 |
| 740.15 | 0 | 747.80 | 25,249 |
| 740.30 | 0 | 747.95 | 28,010 |
| 740.45 | 0 | 748.10 | 30,929 |
| 740.60 | 0 | 748.25 | 34,112 |
| 740.75 | 0 | 748.40 | 37,575 |
| 740.90 | 0 | 748.55 | 41,333 |
| 741.05 | 0 | 748.70 | 45,396 |
| 741.20 | 0 | 748.85 | 49,777 |
| 741.35 | 0 | 749.00 | 54,488 |
| 741.50 | 0 | 749.15 | 59,442 |
| 741.65 | 0 | 749.30 | 64,548 |
| 741.80 | 0 | 749.45 | 69,809 |
| 741.95 | 0 | 749.60 | 75,227 |
| 742.10 | 0 | 749.75 | 80,803 |
| 742.25 | 0 | 749.90 | 86,540 |
| 742.40 | 0 | 750.05 | 92,440 |
| 742.55 | 0 | 750.20 | 98,497 |
| 742.70 | 0 | 750.35 | 104,710 |
| 742.85 | 0 | 750.50 | 111,081 |
| 743.00 | 0 | 750.65 | 117,612 |
| 743.15 | 0 | 750.80 | 124,305 |
| 743.30 | 0 | 750.95 | 131,161 |
| 743.45 | 0 | | |
| 743.60 | 0 | | |
| 743.75 | 0 | | |
| 743.90 | 0 | | |
| 744.05 | 0 | | |
| 744.20 | 0 | | |
| 744.35 | 0 | | |
| 744.50 | 0 | | |
| 744.65 | 0 | | |
| 744.80 | 0 | | |
| 744.95 | 0 | | |
| 745.10 | 0 | | |
| 745.25 | 0 | | |
| 745.40 | 0 | | |
| 745.55 | 0 | | |
| 745.70 | 0 | | |
| 745.85 | 0 | | |
| 746.00 | 0 | | |
| 746.15 | 1,744 | | |
| 746.30 | 3,537 | | |
| 746.45 | 5,382 | | |
| 746.60 | 7,278 | | |
| 746.75 | 9,227 | | |
| 746.90 | 11,228 | | |
| 747.05 | 13,286 | | |
| 747.20 | 15,444 | | |
| 747.35 | 17,716 | | |
| 747.50 | 20,105 | | |

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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Link 1AT: DA #1A Total

Inflow Area = 56.205 ac, 63.22% Impervious, Inflow Depth = 2.79" for 25-yr event
Inflow = 94.15 cfs @ 12.22 hrs, Volume= 13.074 af
Primary = 94.15 cfs @ 12.22 hrs, Volume= 13.074 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Summary for Link DP-1: DP #1 - Rush Crk Trib.

Inflow Area = 56.205 ac, 63.22% Impervious, Inflow Depth = 2.79" for 25-yr event
Inflow = 94.15 cfs @ 12.22 hrs, Volume= 13.074 af
Primary = 94.15 cfs @ 12.22 hrs, Volume= 13.074 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Link DP-2: DP #2 - Smokes Crk

Inflow Area = 83.814 ac, 88.53% Impervious, Inflow Depth = 3.40" for 25-yr event
Inflow = 236.58 cfs @ 12.02 hrs, Volume= 23.780 af
Primary = 236.58 cfs @ 12.02 hrs, Volume= 23.780 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

25-yr Primary Outflow Imported from Proposed Conditions II~Link DP-2.hce

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Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Link DP-3: DP #3 - Rush Crk

Inflow Area = 55.981 ac, 45.79% Impervious, Inflow Depth > 2.59" for 25-yr event
Inflow = 78.16 cfs @ 12.34 hrs, Volume= 12.066 af
Primary = 78.16 cfs @ 12.34 hrs, Volume= 12.066 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

25-yr Primary Outflow Imported from Proposed Conditions III~Link DP-3.hce

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Proposed Conditions - I
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Link PT: Proposed Conditions Total Offsite

Inflow Area = 196.000 ac, 69.06% Impervious, Inflow Depth > 3.00" for 25-yr event
Inflow = 355.68 cfs @ 12.18 hrs, Volume= 48.920 af
Primary = 355.68 cfs @ 12.18 hrs, Volume= 48.920 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 1A-I: DA #1A-I

Runoff = 84.08 cfs @ 12.27 hrs, Volume= 8.748 af, Depth= 4.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 11.558 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 13.442 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 1.044 | 77 | Woods, Good, HSG D |
| 26.044 | 89 | Weighted Average |
| 12.602 | | 48.39% Pervious Area |
| 13.442 | | 51.61% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 26.7 | 150 | 0.0150 | 0.09 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 2.9 | 340 | 0.0150 | 1.97 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 0.4 | 75 | 0.0200 | 2.87 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.8 | 760 | | 4.50 | | Direct Entry, Pipe Flow |
| 32.8 | 1,325 | Total | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 1A-II: DA #1A-II

Runoff = 69.47 cfs @ 11.96 hrs, Volume= 3.670 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 2.746 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 6.783 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.587 | 77 | Woods, Good, HSG D |
| 10.116 | 92 | Weighted Average |
| 3.333 | | 32.95% Pervious Area |
| 6.783 | | 67.05% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.6 | 100 | 0.0170 | 1.07 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 0.9 | 140 | 0.0170 | 2.65 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.3 | 630 | | 4.50 | | Direct Entry, Pipe Flow |
| 4.8 | 870 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 1A-III: DA #1A-III

Runoff = 38.53 cfs @ 11.96 hrs, Volume= 2.110 af, Depth= 4.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.883 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 4.519 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 5.402 | 95 | Weighted Average |
| 0.883 | | 16.35% Pervious Area |
| 4.519 | | 83.65% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.6 | 100 | 0.0170 | 1.07 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 1.3 | 205 | 0.0170 | 2.65 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.9 | 305 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - I

Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 1A-IV: DA #1A-IV

Runoff = 46.36 cfs @ 11.96 hrs, Volume= 2.449 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 2.082 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 4.668 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 6.750 | 92 | Weighted Average |
| 2.082 | | 30.84% Pervious Area |
| 4.668 | | 69.16% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.6 | 100 | 0.0170 | 1.07 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 0.7 | 110 | 0.0170 | 2.65 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.4 | 360 | | 2.50 | | Direct Entry, |
| 4.7 | 570 | | | | Total, Increased to minimum Tc = 6.0 min |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 1A-V: DA #1A-V

Runoff = 37.53 cfs @ 11.96 hrs, Volume= 2.028 af, Depth= 4.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 1.233 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 4.088 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 5.321 | 94 | Weighted Average |
| 1.233 | | 23.17% Pervious Area |
| 4.088 | | 76.83% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.6 | 100 | 0.0170 | 1.07 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 1.4 | 225 | 0.0170 | 2.65 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 1.3 | 200 | | 2.50 | | Direct Entry, Swale Flow |
| 4.3 | 525 | | | | Total, Increased to minimum Tc = 6.0 min |

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Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 1A-VI: DA #1A-V

Runoff = 18.14 cfs @ 11.96 hrs, Volume= 0.980 af, Depth= 4.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.542 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 2.030 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 2.572 | 94 | Weighted Average |
| 0.542 | | 21.07% Pervious Area |
| 2.030 | | 78.93% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|--|-------------------|----------------|--|
| 1.5 | 100 | 0.0200 | 1.14 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 2.0 | 350 | 0.0200 | 2.87 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 1.3 | 200 | | 2.50 | | Direct Entry, Swale Flow |
| 4.8 | 650 | Total, Increased to minimum Tc = 6.0 min | | | |

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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Pond B-1: Bioretention B-1

Inflow Area = 5.402 ac, 83.65% Impervious, Inflow Depth = 4.69" for 100-yr event
Inflow = 38.53 cfs @ 11.96 hrs, Volume= 2.110 af
Outflow = 20.75 cfs @ 12.05 hrs, Volume= 1.954 af, Atten= 46%, Lag= 5.4 min
Primary = 7.85 cfs @ 12.05 hrs, Volume= 1.495 af
Secondary = 12.91 cfs @ 12.06 hrs, Volume= 0.460 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 751.15' @ 12.06 hrs Surf.Area= 15,856 sf Storage= 27,562 cf

Plug-Flow detention time= 93.9 min calculated for 1.954 af (93% of inflow)
Center-of-Mass det. time= 52.0 min (815.2 - 763.2)

| Volume | Invert | Avail.Storage | Storage Description |
|------------------|-------------------|------------------------|--|
| #1 | 749.25' | 29,200 cf | Surf. Storage (Prismatic) Listed below (Recalc) |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 749.25 | 13,200 | 0 | 0 |
| 751.25 | 16,000 | 29,200 | 29,200 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|---|
| #1 | Primary | 747.25' | 15.0" Round Culvert-Primary L= 87.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 747.25' / 747.00' S= 0.0029 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf |
| #2 | Device 1 | 749.75' | 24.0" x 24.0" Horiz. Grate-Primary C= 0.600 Limited to weir flow at low heads |
| #3 | Primary | 751.00' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |
| #4 | Secondary | 745.75' | 15.0" Round Culvert-Secondary L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 745.75' / 744.13' S= 0.0360 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf |
| #5 | Device 4 | 750.25' | 24.0" x 24.0" Horiz. Grate-Secondary C= 0.600 Limited to weir flow at low heads |

Primary OutFlow Max=7.54 cfs @ 12.05 hrs HW=751.14' TW=750.03' (Dynamic Tailwater)

- 1=Culvert-Primary (Outlet Controls 5.78 cfs @ 4.71 fps)
- 2=Grate-Primary (Passes 5.78 cfs of 20.31 cfs potential flow)
- 3=Sharp-Crested Rectangular Weir (Weir Controls 1.76 cfs @ 1.24 fps)

Secondary OutFlow Max=12.89 cfs @ 12.06 hrs HW=751.14' TW=0.00' (Dynamic Tailwater)

- 4=Culvert-Secondary (Inlet Controls 12.89 cfs @ 10.51 fps)
- 5=Grate-Secondary (Passes 12.89 cfs of 18.12 cfs potential flow)

Proposed Conditions I

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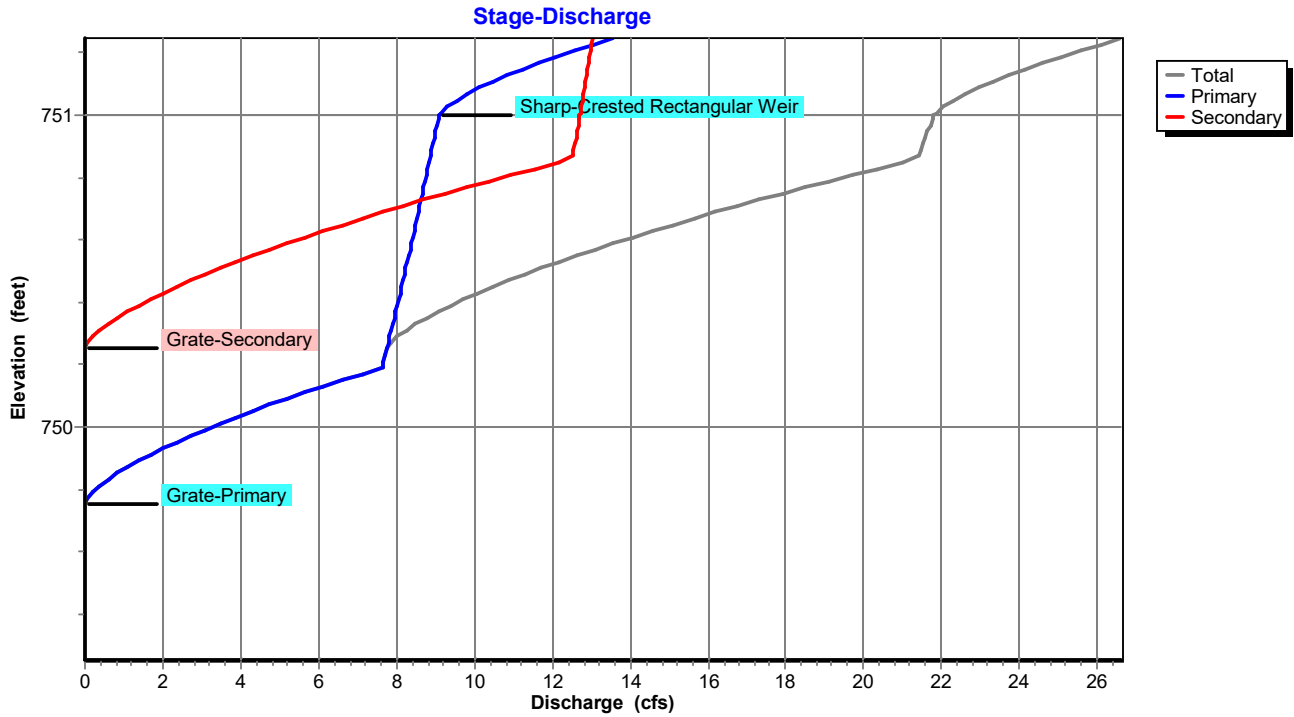
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Proposed Conditions - I
 Type II 24-hr 100-yr Rainfall=5.27"

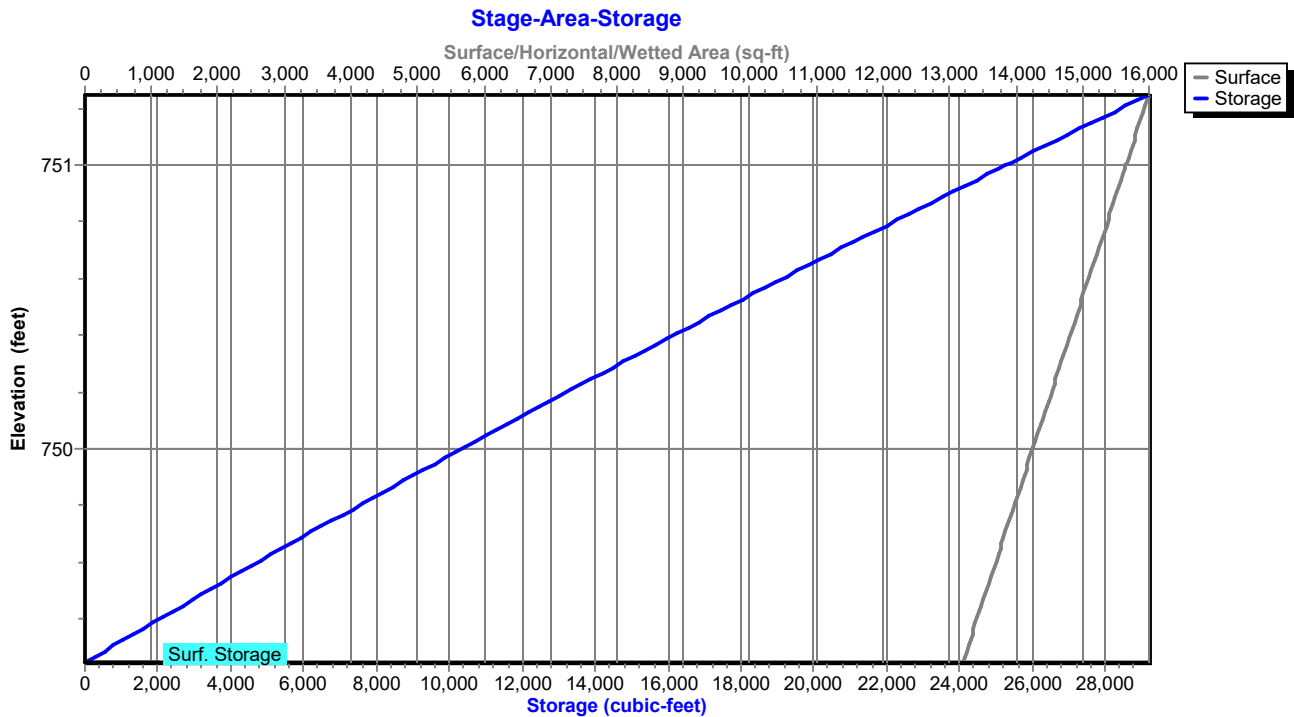
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Pond B-1: Bioretention B-1



Pond B-1: Bioretention B-1



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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

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Stage-Discharge for Pond B-1: Bioretention B-1

| Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) | Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) |
|---------------------|--------------------|------------------|--------------------|---------------------|--------------------|------------------|--------------------|
| 749.25 | 0.00 | 0.00 | 0.00 | 750.27 | 7.86 | 7.79 | 0.07 |
| 749.27 | 0.00 | 0.00 | 0.00 | 750.29 | 8.04 | 7.83 | 0.21 |
| 749.29 | 0.00 | 0.00 | 0.00 | 750.31 | 8.25 | 7.87 | 0.38 |
| 749.31 | 0.00 | 0.00 | 0.00 | 750.33 | 8.50 | 7.90 | 0.59 |
| 749.33 | 0.00 | 0.00 | 0.00 | 750.35 | 8.77 | 7.94 | 0.83 |
| 749.35 | 0.00 | 0.00 | 0.00 | 750.37 | 9.07 | 7.98 | 1.09 |
| 749.37 | 0.00 | 0.00 | 0.00 | 750.39 | 9.39 | 8.02 | 1.37 |
| 749.39 | 0.00 | 0.00 | 0.00 | 750.41 | 9.73 | 8.06 | 1.67 |
| 749.41 | 0.00 | 0.00 | 0.00 | 750.43 | 10.09 | 8.09 | 2.00 |
| 749.43 | 0.00 | 0.00 | 0.00 | 750.45 | 10.47 | 8.13 | 2.34 |
| 749.45 | 0.00 | 0.00 | 0.00 | 750.47 | 10.87 | 8.17 | 2.70 |
| 749.47 | 0.00 | 0.00 | 0.00 | 750.49 | 11.28 | 8.20 | 3.08 |
| 749.49 | 0.00 | 0.00 | 0.00 | 750.51 | 11.71 | 8.24 | 3.47 |
| 749.51 | 0.00 | 0.00 | 0.00 | 750.53 | 12.15 | 8.28 | 3.88 |
| 749.53 | 0.00 | 0.00 | 0.00 | 750.55 | 12.61 | 8.31 | 4.30 |
| 749.55 | 0.00 | 0.00 | 0.00 | 750.57 | 13.08 | 8.35 | 4.74 |
| 749.57 | 0.00 | 0.00 | 0.00 | 750.59 | 13.57 | 8.38 | 5.19 |
| 749.59 | 0.00 | 0.00 | 0.00 | 750.61 | 14.07 | 8.42 | 5.65 |
| 749.61 | 0.00 | 0.00 | 0.00 | 750.63 | 14.58 | 8.46 | 6.13 |
| 749.63 | 0.00 | 0.00 | 0.00 | 750.65 | 15.11 | 8.49 | 6.62 |
| 749.65 | 0.00 | 0.00 | 0.00 | 750.67 | 15.65 | 8.53 | 7.12 |
| 749.67 | 0.00 | 0.00 | 0.00 | 750.69 | 16.20 | 8.56 | 7.64 |
| 749.69 | 0.00 | 0.00 | 0.00 | 750.71 | 16.76 | 8.60 | 8.16 |
| 749.71 | 0.00 | 0.00 | 0.00 | 750.73 | 17.33 | 8.63 | 8.70 |
| 749.73 | 0.00 | 0.00 | 0.00 | 750.75 | 17.91 | 8.67 | 9.25 |
| 749.75 | 0.00 | 0.00 | 0.00 | 750.77 | 18.51 | 8.70 | 9.81 |
| 749.77 | 0.07 | 0.07 | 0.00 | 750.79 | 19.12 | 8.73 | 10.38 |
| 749.79 | 0.21 | 0.21 | 0.00 | 750.81 | 19.73 | 8.77 | 10.96 |
| 749.81 | 0.38 | 0.38 | 0.00 | 750.83 | 20.36 | 8.80 | 11.56 |
| 749.83 | 0.59 | 0.59 | 0.00 | 750.85 | 21.00 | 8.84 | 12.16 |
| 749.85 | 0.83 | 0.83 | 0.00 | 750.87 | 21.40 | 8.87 | 12.53 |
| 749.87 | 1.09 | 1.09 | 0.00 | 750.89 | 21.46 | 8.91 | 12.56 |
| 749.89 | 1.37 | 1.37 | 0.00 | 750.91 | 21.52 | 8.94 | 12.58 |
| 749.91 | 1.67 | 1.67 | 0.00 | 750.93 | 21.58 | 8.97 | 12.61 |
| 749.93 | 2.00 | 2.00 | 0.00 | 750.95 | 21.64 | 9.01 | 12.64 |
| 749.95 | 2.34 | 2.34 | 0.00 | 750.97 | 21.71 | 9.04 | 12.67 |
| 749.97 | 2.70 | 2.70 | 0.00 | 750.99 | 21.77 | 9.07 | 12.69 |
| 749.99 | 3.08 | 3.08 | 0.00 | 751.01 | 21.86 | 9.14 | 12.72 |
| 750.01 | 3.47 | 3.47 | 0.00 | 751.03 | 22.06 | 9.31 | 12.75 |
| 750.03 | 3.88 | 3.88 | 0.00 | 751.05 | 22.31 | 9.54 | 12.78 |
| 750.05 | 4.30 | 4.30 | 0.00 | 751.07 | 22.61 | 9.81 | 12.80 |
| 750.07 | 4.74 | 4.74 | 0.00 | 751.09 | 22.95 | 10.12 | 12.83 |
| 750.09 | 5.19 | 5.19 | 0.00 | 751.11 | 23.32 | 10.46 | 12.86 |
| 750.11 | 5.65 | 5.65 | 0.00 | 751.13 | 23.71 | 10.83 | 12.88 |
| 750.13 | 6.13 | 6.13 | 0.00 | 751.15 | 24.14 | 11.23 | 12.91 |
| 750.15 | 6.62 | 6.62 | 0.00 | 751.17 | 24.59 | 11.65 | 12.94 |
| 750.17 | 7.12 | 7.12 | 0.00 | 751.19 | 25.06 | 12.10 | 12.97 |
| 750.19 | 7.63 | 7.63 | 0.00 | 751.21 | 25.56 | 12.56 | 12.99 |
| 750.21 | 7.67 | 7.67 | 0.00 | 751.23 | 26.07 | 13.05 | 13.02 |
| 750.23 | 7.71 | 7.71 | 0.00 | 751.25 | 26.61 | 13.56 | 13.05 |
| 750.25 | 7.75 | 7.75 | 0.00 | | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

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Stage-Area-Storage for Pond B-1: Bioretention B-1

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 749.25 | 13,200 | 0 | 750.27 | 14,628 | 14,192 |
| 749.27 | 13,228 | 264 | 750.29 | 14,656 | 14,485 |
| 749.29 | 13,256 | 529 | 750.31 | 14,684 | 14,779 |
| 749.31 | 13,284 | 795 | 750.33 | 14,712 | 15,072 |
| 749.33 | 13,312 | 1,060 | 750.35 | 14,740 | 15,367 |
| 749.35 | 13,340 | 1,327 | 750.37 | 14,768 | 15,662 |
| 749.37 | 13,368 | 1,594 | 750.39 | 14,796 | 15,958 |
| 749.39 | 13,396 | 1,862 | 750.41 | 14,824 | 16,254 |
| 749.41 | 13,424 | 2,130 | 750.43 | 14,852 | 16,551 |
| 749.43 | 13,452 | 2,399 | 750.45 | 14,880 | 16,848 |
| 749.45 | 13,480 | 2,668 | 750.47 | 14,908 | 17,146 |
| 749.47 | 13,508 | 2,938 | 750.49 | 14,936 | 17,444 |
| 749.49 | 13,536 | 3,208 | 750.51 | 14,964 | 17,743 |
| 749.51 | 13,564 | 3,479 | 750.53 | 14,992 | 18,043 |
| 749.53 | 13,592 | 3,751 | 750.55 | 15,020 | 18,343 |
| 749.55 | 13,620 | 4,023 | 750.57 | 15,048 | 18,644 |
| 749.57 | 13,648 | 4,296 | 750.59 | 15,076 | 18,945 |
| 749.59 | 13,676 | 4,569 | 750.61 | 15,104 | 19,247 |
| 749.61 | 13,704 | 4,843 | 750.63 | 15,132 | 19,549 |
| 749.63 | 13,732 | 5,117 | 750.65 | 15,160 | 19,852 |
| 749.65 | 13,760 | 5,392 | 750.67 | 15,188 | 20,155 |
| 749.67 | 13,788 | 5,667 | 750.69 | 15,216 | 20,460 |
| 749.69 | 13,816 | 5,944 | 750.71 | 15,244 | 20,764 |
| 749.71 | 13,844 | 6,220 | 750.73 | 15,272 | 21,069 |
| 749.73 | 13,872 | 6,497 | 750.75 | 15,300 | 21,375 |
| 749.75 | 13,900 | 6,775 | 750.77 | 15,328 | 21,681 |
| 749.77 | 13,928 | 7,053 | 750.79 | 15,356 | 21,988 |
| 749.79 | 13,956 | 7,332 | 750.81 | 15,384 | 22,296 |
| 749.81 | 13,984 | 7,612 | 750.83 | 15,412 | 22,603 |
| 749.83 | 14,012 | 7,891 | 750.85 | 15,440 | 22,912 |
| 749.85 | 14,040 | 8,172 | 750.87 | 15,468 | 23,221 |
| 749.87 | 14,068 | 8,453 | 750.89 | 15,496 | 23,531 |
| 749.89 | 14,096 | 8,735 | 750.91 | 15,524 | 23,841 |
| 749.91 | 14,124 | 9,017 | 750.93 | 15,552 | 24,152 |
| 749.93 | 14,152 | 9,300 | 750.95 | 15,580 | 24,463 |
| 749.95 | 14,180 | 9,583 | 750.97 | 15,608 | 24,775 |
| 749.97 | 14,208 | 9,867 | 750.99 | 15,636 | 25,087 |
| 749.99 | 14,236 | 10,151 | 751.01 | 15,664 | 25,400 |
| 750.01 | 14,264 | 10,436 | 751.03 | 15,692 | 25,714 |
| 750.03 | 14,292 | 10,722 | 751.05 | 15,720 | 26,028 |
| 750.05 | 14,320 | 11,008 | 751.07 | 15,748 | 26,343 |
| 750.07 | 14,348 | 11,295 | 751.09 | 15,776 | 26,658 |
| 750.09 | 14,376 | 11,582 | 751.11 | 15,804 | 26,974 |
| 750.11 | 14,404 | 11,870 | 751.13 | 15,832 | 27,290 |
| 750.13 | 14,432 | 12,158 | 751.15 | 15,860 | 27,607 |
| 750.15 | 14,460 | 12,447 | 751.17 | 15,888 | 27,924 |
| 750.17 | 14,488 | 12,736 | 751.19 | 15,916 | 28,243 |
| 750.19 | 14,516 | 13,027 | 751.21 | 15,944 | 28,561 |
| 750.21 | 14,544 | 13,317 | 751.23 | 15,972 | 28,880 |
| 750.23 | 14,572 | 13,608 | 751.25 | 16,000 | 29,200 |
| 750.25 | 14,600 | 13,900 | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Pond B-2: Bioretention B-2

Inflow Area = 6.750 ac, 69.16% Impervious, Inflow Depth = 4.35" for 100-yr event
 Inflow = 46.36 cfs @ 11.96 hrs, Volume= 2.449 af
 Outflow = 20.36 cfs @ 12.07 hrs, Volume= 2.255 af, Atten= 56%, Lag= 6.6 min
 Primary = 11.98 cfs @ 12.07 hrs, Volume= 1.839 af
 Secondary = 8.37 cfs @ 12.08 hrs, Volume= 0.416 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Peak Elev= 751.40' @ 12.08 hrs Surf.Area= 29,249 sf Storage= 42,034 cf

Plug-Flow detention time= 113.7 min calculated for 2.255 af (92% of inflow)
 Center-of-Mass det. time= 70.0 min (847.7 - 777.7)

| Volume | Invert | Avail.Storage | Storage Description |
|------------------|-------------------|------------------------|--|
| #1 | 749.50' | 45,000 cf | Surf. Storage (Prismatic) Listed below (Recalc) |
| | | | |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 749.50 | 15,000 | 0 | 0 |
| 751.50 | 30,000 | 45,000 | 45,000 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|--|
| #1 | Primary | 747.50' | 12.0" Round Culvert-Primary L= 105.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 747.50' / 747.25' S= 0.0024 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf |
| #2 | Device 1 | 750.00' | 24.0" x 24.0" Horiz. Grate-Primary C= 0.600 Limited to weir flow at low heads |
| #3 | Secondary | 746.00' | 12.0" Round Culvert-Secondary L= 130.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 746.00' / 738.10' S= 0.0608 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf |
| #4 | Device 3 | 750.75' | 24.0" x 24.0" Horiz. Grate-Secondary C= 0.600 Limited to weir flow at low heads |
| #5 | Primary | 751.00' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=11.55 cfs @ 12.07 hrs HW=751.39' TW=750.03' (Dynamic Tailwater)

- ↑ 1=Culvert-Primary (Outlet Controls 3.55 cfs @ 4.51 fps)
- ↑ 2=Grate-Primary (Passes 3.55 cfs of 22.49 cfs potential flow)
- ↑ 5=Sharp-Crested Rectangular Weir (Weir Controls 8.00 cfs @ 2.05 fps)

Secondary OutFlow Max=8.37 cfs @ 12.08 hrs HW=751.39' TW=0.00' (Dynamic Tailwater)

- ↑ 3=Culvert-Secondary (Inlet Controls 8.37 cfs @ 10.65 fps)
- ↑ 4=Grate-Secondary (Passes 8.37 cfs of 13.50 cfs potential flow)

Proposed Conditions I

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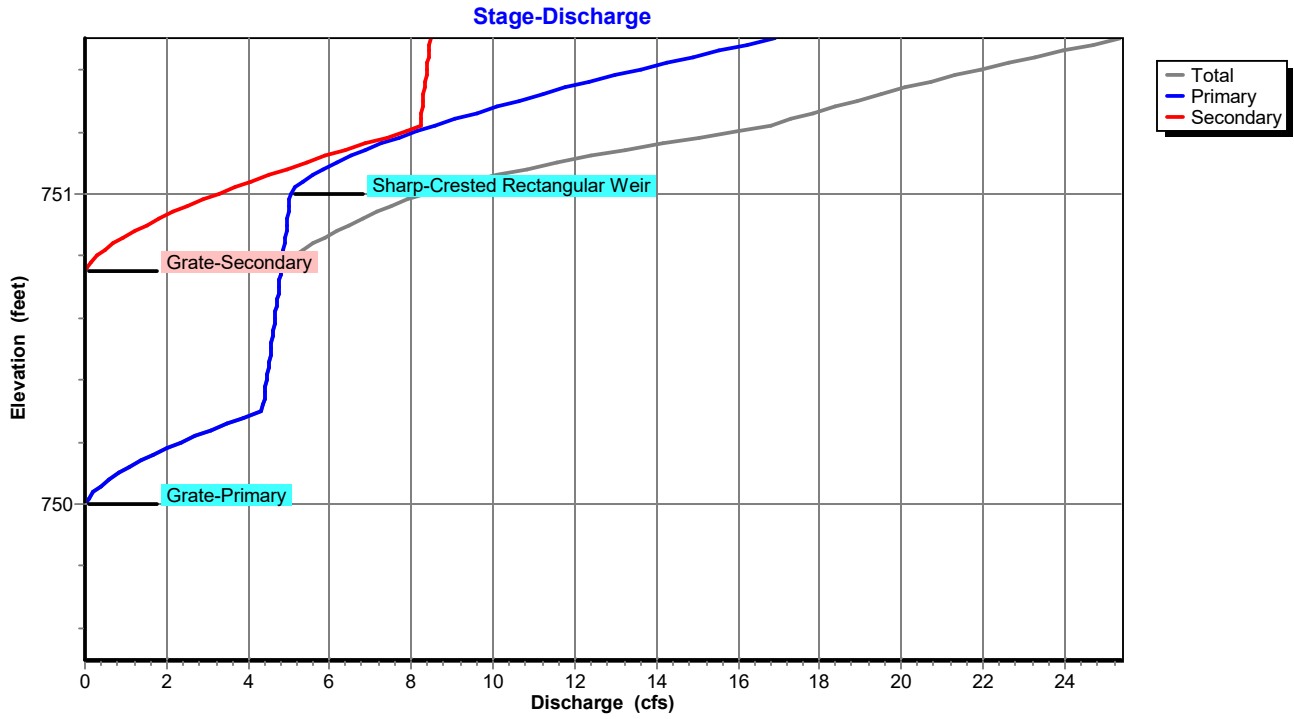
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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

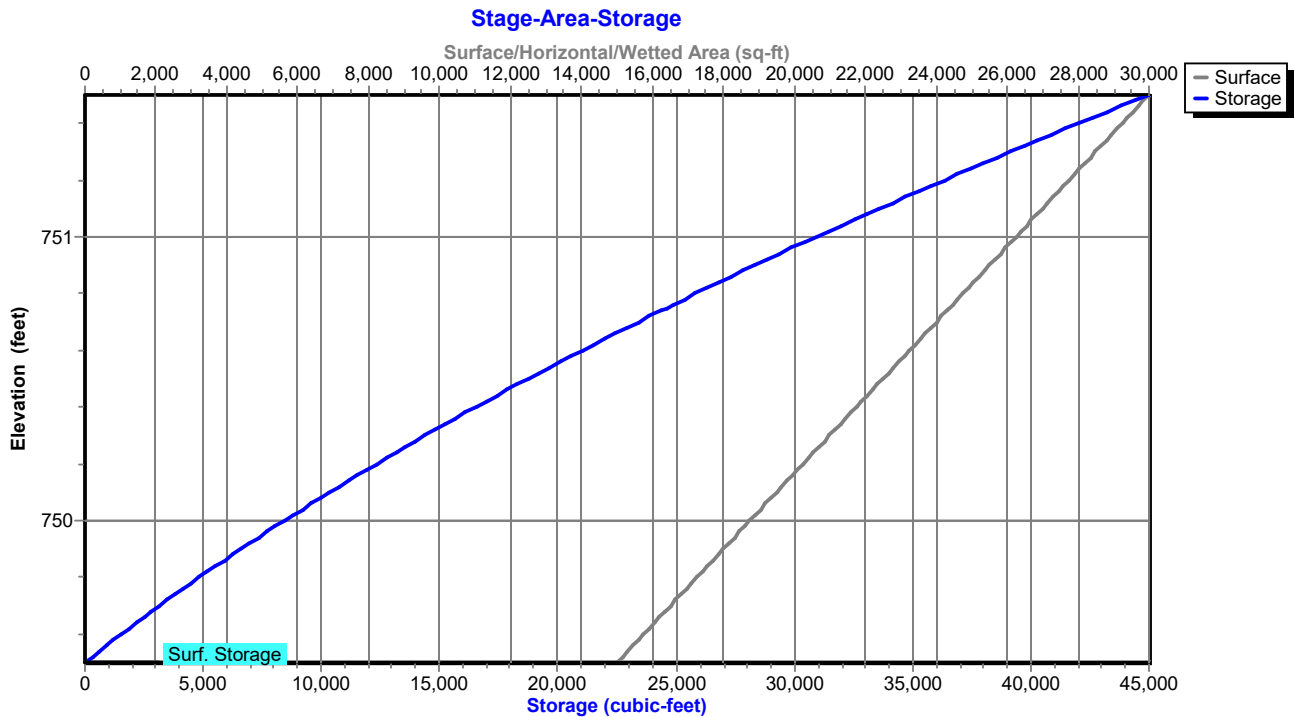
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Pond B-2: Bioretention B-2



Pond B-2: Bioretention B-2



Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

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Stage-Discharge for Pond B-2: Bioretention B-2

| Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) | Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) |
|---------------------|--------------------|------------------|--------------------|---------------------|--------------------|------------------|--------------------|
| 749.50 | 0.00 | 0.00 | 0.00 | 750.52 | 4.57 | 4.57 | 0.00 |
| 749.52 | 0.00 | 0.00 | 0.00 | 750.54 | 4.59 | 4.59 | 0.00 |
| 749.54 | 0.00 | 0.00 | 0.00 | 750.56 | 4.61 | 4.61 | 0.00 |
| 749.56 | 0.00 | 0.00 | 0.00 | 750.58 | 4.63 | 4.63 | 0.00 |
| 749.58 | 0.00 | 0.00 | 0.00 | 750.60 | 4.65 | 4.65 | 0.00 |
| 749.60 | 0.00 | 0.00 | 0.00 | 750.62 | 4.67 | 4.67 | 0.00 |
| 749.62 | 0.00 | 0.00 | 0.00 | 750.64 | 4.69 | 4.69 | 0.00 |
| 749.64 | 0.00 | 0.00 | 0.00 | 750.66 | 4.71 | 4.71 | 0.00 |
| 749.66 | 0.00 | 0.00 | 0.00 | 750.68 | 4.73 | 4.73 | 0.00 |
| 749.68 | 0.00 | 0.00 | 0.00 | 750.70 | 4.75 | 4.75 | 0.00 |
| 749.70 | 0.00 | 0.00 | 0.00 | 750.72 | 4.77 | 4.77 | 0.00 |
| 749.72 | 0.00 | 0.00 | 0.00 | 750.74 | 4.79 | 4.79 | 0.00 |
| 749.74 | 0.00 | 0.00 | 0.00 | 750.76 | 4.84 | 4.81 | 0.03 |
| 749.76 | 0.00 | 0.00 | 0.00 | 750.78 | 4.97 | 4.83 | 0.14 |
| 749.78 | 0.00 | 0.00 | 0.00 | 750.80 | 5.14 | 4.85 | 0.29 |
| 749.80 | 0.00 | 0.00 | 0.00 | 750.82 | 5.35 | 4.87 | 0.48 |
| 749.82 | 0.00 | 0.00 | 0.00 | 750.84 | 5.59 | 4.89 | 0.71 |
| 749.84 | 0.00 | 0.00 | 0.00 | 750.86 | 5.86 | 4.91 | 0.95 |
| 749.86 | 0.00 | 0.00 | 0.00 | 750.88 | 6.15 | 4.92 | 1.23 |
| 749.88 | 0.00 | 0.00 | 0.00 | 750.90 | 6.46 | 4.94 | 1.52 |
| 749.90 | 0.00 | 0.00 | 0.00 | 750.92 | 6.79 | 4.96 | 1.83 |
| 749.92 | 0.00 | 0.00 | 0.00 | 750.94 | 7.15 | 4.98 | 2.17 |
| 749.94 | 0.00 | 0.00 | 0.00 | 750.96 | 7.52 | 5.00 | 2.52 |
| 749.96 | 0.00 | 0.00 | 0.00 | 750.98 | 7.90 | 5.02 | 2.89 |
| 749.98 | 0.00 | 0.00 | 0.00 | 751.00 | 8.31 | 5.04 | 3.27 |
| 750.00 | 0.00 | 0.00 | 0.00 | 751.02 | 8.82 | 5.15 | 3.67 |
| 750.02 | 0.07 | 0.07 | 0.00 | 751.04 | 9.42 | 5.33 | 4.09 |
| 750.04 | 0.21 | 0.21 | 0.00 | 751.06 | 10.08 | 5.57 | 4.52 |
| 750.06 | 0.38 | 0.38 | 0.00 | 751.08 | 10.81 | 5.85 | 4.96 |
| 750.08 | 0.59 | 0.59 | 0.00 | 751.10 | 11.57 | 6.16 | 5.42 |
| 750.10 | 0.83 | 0.83 | 0.00 | 751.12 | 12.39 | 6.50 | 5.89 |
| 750.12 | 1.09 | 1.09 | 0.00 | 751.14 | 13.24 | 6.87 | 6.37 |
| 750.14 | 1.37 | 1.37 | 0.00 | 751.16 | 14.13 | 7.27 | 6.87 |
| 750.16 | 1.67 | 1.67 | 0.00 | 751.18 | 15.06 | 7.69 | 7.38 |
| 750.18 | 2.00 | 2.00 | 0.00 | 751.20 | 16.02 | 8.13 | 7.90 |
| 750.20 | 2.34 | 2.34 | 0.00 | 751.22 | 16.81 | 8.59 | 8.22 |
| 750.22 | 2.70 | 2.70 | 0.00 | 751.24 | 17.31 | 9.08 | 8.23 |
| 750.24 | 3.08 | 3.08 | 0.00 | 751.26 | 17.83 | 9.58 | 8.25 |
| 750.26 | 3.47 | 3.47 | 0.00 | 751.28 | 18.37 | 10.10 | 8.27 |
| 750.28 | 3.88 | 3.88 | 0.00 | 751.30 | 18.93 | 10.64 | 8.29 |
| 750.30 | 4.30 | 4.30 | 0.00 | 751.32 | 19.50 | 11.20 | 8.30 |
| 750.32 | 4.37 | 4.37 | 0.00 | 751.34 | 20.10 | 11.78 | 8.32 |
| 750.34 | 4.39 | 4.39 | 0.00 | 751.36 | 20.70 | 12.37 | 8.34 |
| 750.36 | 4.41 | 4.41 | 0.00 | 751.38 | 21.33 | 12.97 | 8.35 |
| 750.38 | 4.43 | 4.43 | 0.00 | 751.40 | 21.97 | 13.60 | 8.37 |
| 750.40 | 4.45 | 4.45 | 0.00 | 751.42 | 22.62 | 14.23 | 8.39 |
| 750.42 | 4.47 | 4.47 | 0.00 | 751.44 | 23.29 | 14.88 | 8.41 |
| 750.44 | 4.49 | 4.49 | 0.00 | 751.46 | 23.97 | 15.55 | 8.42 |
| 750.46 | 4.51 | 4.51 | 0.00 | 751.48 | 24.67 | 16.23 | 8.44 |
| 750.48 | 4.53 | 4.53 | 0.00 | 751.50 | 25.38 | 16.92 | 8.46 |
| 750.50 | 4.55 | 4.55 | 0.00 | | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

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Stage-Area-Storage for Pond B-2: Bioretention B-2

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 749.50 | 15,000 | 0 | 750.52 | 22,650 | 19,201 |
| 749.52 | 15,150 | 301 | 750.54 | 22,800 | 19,656 |
| 749.54 | 15,300 | 606 | 750.56 | 22,950 | 20,113 |
| 749.56 | 15,450 | 913 | 750.58 | 23,100 | 20,574 |
| 749.58 | 15,600 | 1,224 | 750.60 | 23,250 | 21,038 |
| 749.60 | 15,750 | 1,538 | 750.62 | 23,400 | 21,504 |
| 749.62 | 15,900 | 1,854 | 750.64 | 23,550 | 21,973 |
| 749.64 | 16,050 | 2,173 | 750.66 | 23,700 | 22,446 |
| 749.66 | 16,200 | 2,496 | 750.68 | 23,850 | 22,921 |
| 749.68 | 16,350 | 2,821 | 750.70 | 24,000 | 23,400 |
| 749.70 | 16,500 | 3,150 | 750.72 | 24,150 | 23,882 |
| 749.72 | 16,650 | 3,482 | 750.74 | 24,300 | 24,366 |
| 749.74 | 16,800 | 3,816 | 750.76 | 24,450 | 24,853 |
| 749.76 | 16,950 | 4,153 | 750.78 | 24,600 | 25,344 |
| 749.78 | 17,100 | 4,494 | 750.80 | 24,750 | 25,837 |
| 749.80 | 17,250 | 4,837 | 750.82 | 24,900 | 26,334 |
| 749.82 | 17,400 | 5,184 | 750.84 | 25,050 | 26,834 |
| 749.84 | 17,550 | 5,534 | 750.86 | 25,200 | 27,336 |
| 749.86 | 17,700 | 5,886 | 750.88 | 25,350 | 27,841 |
| 749.88 | 17,850 | 6,241 | 750.90 | 25,500 | 28,350 |
| 749.90 | 18,000 | 6,600 | 750.92 | 25,650 | 28,861 |
| 749.92 | 18,150 | 6,961 | 750.94 | 25,800 | 29,376 |
| 749.94 | 18,300 | 7,326 | 750.96 | 25,950 | 29,894 |
| 749.96 | 18,450 | 7,694 | 750.98 | 26,100 | 30,414 |
| 749.98 | 18,600 | 8,064 | 751.00 | 26,250 | 30,938 |
| 750.00 | 18,750 | 8,438 | 751.02 | 26,400 | 31,464 |
| 750.02 | 18,900 | 8,814 | 751.04 | 26,550 | 31,993 |
| 750.04 | 19,050 | 9,193 | 751.06 | 26,700 | 32,526 |
| 750.06 | 19,200 | 9,576 | 751.08 | 26,850 | 33,062 |
| 750.08 | 19,350 | 9,962 | 751.10 | 27,000 | 33,600 |
| 750.10 | 19,500 | 10,350 | 751.12 | 27,150 | 34,142 |
| 750.12 | 19,650 | 10,742 | 751.14 | 27,300 | 34,686 |
| 750.14 | 19,800 | 11,136 | 751.16 | 27,450 | 35,233 |
| 750.16 | 19,950 | 11,533 | 751.18 | 27,600 | 35,784 |
| 750.18 | 20,100 | 11,934 | 751.20 | 27,750 | 36,338 |
| 750.20 | 20,250 | 12,338 | 751.22 | 27,900 | 36,894 |
| 750.22 | 20,400 | 12,744 | 751.24 | 28,050 | 37,454 |
| 750.24 | 20,550 | 13,154 | 751.26 | 28,200 | 38,016 |
| 750.26 | 20,700 | 13,566 | 751.28 | 28,350 | 38,581 |
| 750.28 | 20,850 | 13,981 | 751.30 | 28,500 | 39,150 |
| 750.30 | 21,000 | 14,400 | 751.32 | 28,650 | 39,722 |
| 750.32 | 21,150 | 14,822 | 751.34 | 28,800 | 40,296 |
| 750.34 | 21,300 | 15,246 | 751.36 | 28,950 | 40,874 |
| 750.36 | 21,450 | 15,674 | 751.38 | 29,100 | 41,454 |
| 750.38 | 21,600 | 16,104 | 751.40 | 29,250 | 42,037 |
| 750.40 | 21,750 | 16,537 | 751.42 | 29,400 | 42,624 |
| 750.42 | 21,900 | 16,974 | 751.44 | 29,550 | 43,214 |
| 750.44 | 22,050 | 17,414 | 751.46 | 29,700 | 43,806 |
| 750.46 | 22,200 | 17,856 | 751.48 | 29,850 | 44,402 |
| 750.48 | 22,350 | 18,302 | 751.50 | 30,000 | 45,000 |
| 750.50 | 22,500 | 18,750 | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Pond B-3: Bioretention B-3

Inflow Area = 5.321 ac, 76.83% Impervious, Inflow Depth = 4.57" for 100-yr event
Inflow = 37.53 cfs @ 11.96 hrs, Volume= 2.028 af
Outflow = 14.49 cfs @ 12.09 hrs, Volume= 1.873 af, Atten= 61%, Lag= 7.6 min
Primary = 14.49 cfs @ 12.09 hrs, Volume= 1.873 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 751.98' @ 12.09 hrs Surf.Area= 23,865 sf Storage= 35,461 cf

Plug-Flow detention time= 116.1 min calculated for 1.873 af (92% of inflow)
Center-of-Mass det. time= 73.3 min (841.7 - 768.5)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|--|
| #1 | 750.00' | 36,000 cf | Surf. Storage (Prismatic) Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 750.00 | 12,000 | 0 | 0 |
| 752.00 | 24,000 | 36,000 | 36,000 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|---------|--|
| #1 | Primary | 746.50' | 8.0" Round Culvert-Primary L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 746.50' / 746.00' S= 0.0167 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf |
| #2 | Device 1 | 750.50' | 24.0" x 24.0" Horiz. Grate-Primary C= 0.600 Limited to weir flow at low heads |
| #3 | Primary | 751.50' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=14.34 cfs @ 12.09 hrs HW=751.97' TW=0.00' (Dynamic Tailwater)

- 1=Culvert-Primary (Barrel Controls 3.80 cfs @ 10.90 fps)
- 2=Grate-Primary (Passes 3.80 cfs of 23.38 cfs potential flow)
- 3=Sharp-Crested Rectangular Weir (Weir Controls 10.54 cfs @ 2.25 fps)

Proposed Conditions I

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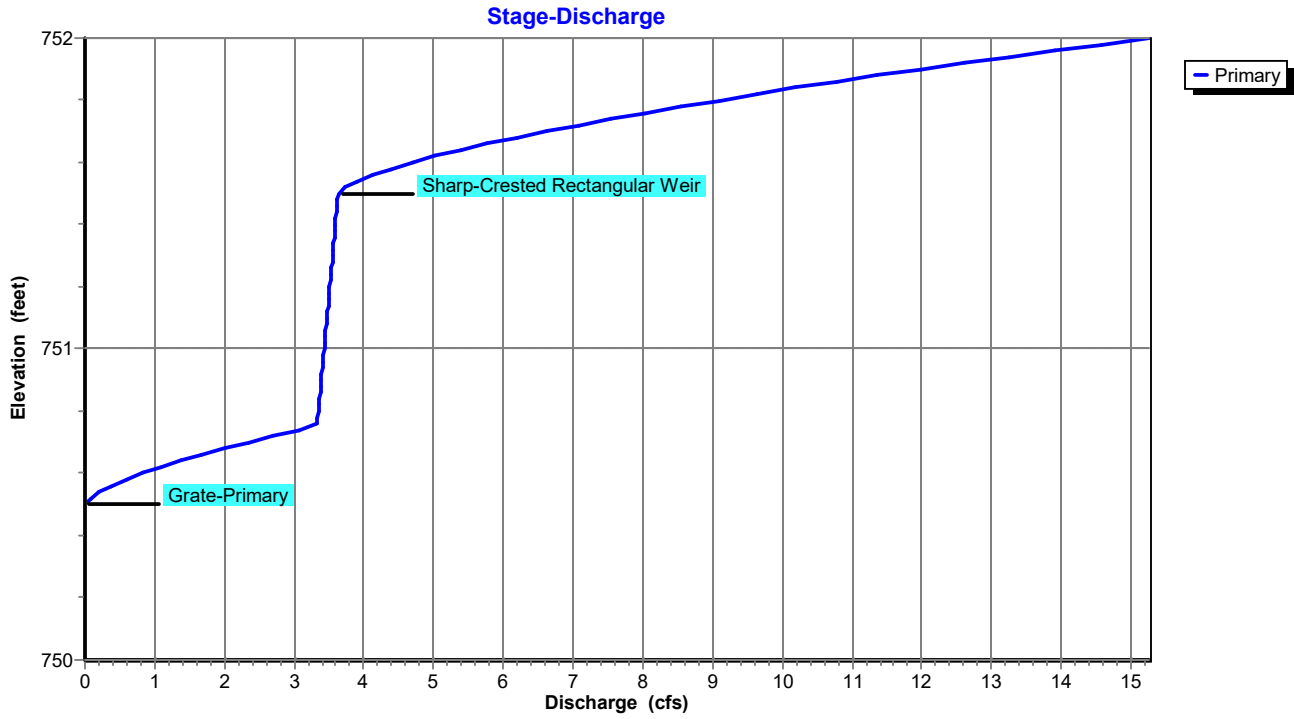
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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

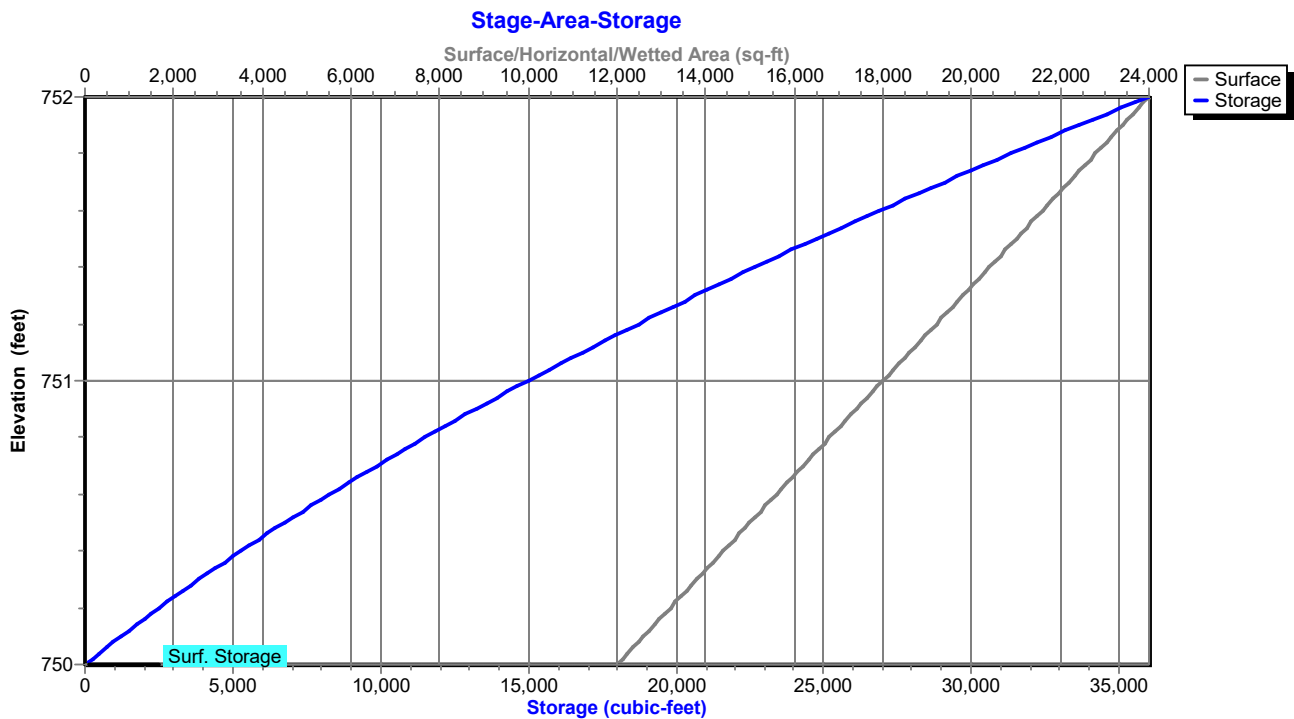
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Pond B-3: Bioretention B-3



Pond B-3: Bioretention B-3



Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

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Stage-Discharge for Pond B-3: Bioretention B-3

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|
| 750.00 | 0.00 | 750.51 | 0.03 | 751.02 | 3.44 | 751.53 | 3.81 |
| 750.01 | 0.00 | 750.52 | 0.07 | 751.03 | 3.44 | 751.54 | 3.91 |
| 750.02 | 0.00 | 750.53 | 0.14 | 751.04 | 3.45 | 751.55 | 4.01 |
| 750.03 | 0.00 | 750.54 | 0.21 | 751.05 | 3.45 | 751.56 | 4.13 |
| 750.04 | 0.00 | 750.55 | 0.29 | 751.06 | 3.46 | 751.57 | 4.26 |
| 750.05 | 0.00 | 750.56 | 0.38 | 751.07 | 3.46 | 751.58 | 4.40 |
| 750.06 | 0.00 | 750.57 | 0.48 | 751.08 | 3.46 | 751.59 | 4.55 |
| 750.07 | 0.00 | 750.58 | 0.59 | 751.09 | 3.47 | 751.60 | 4.70 |
| 750.08 | 0.00 | 750.59 | 0.71 | 751.10 | 3.47 | 751.61 | 4.86 |
| 750.09 | 0.00 | 750.60 | 0.83 | 751.11 | 3.48 | 751.62 | 5.03 |
| 750.10 | 0.00 | 750.61 | 0.95 | 751.12 | 3.48 | 751.63 | 5.21 |
| 750.11 | 0.00 | 750.62 | 1.09 | 751.13 | 3.48 | 751.64 | 5.39 |
| 750.12 | 0.00 | 750.63 | 1.23 | 751.14 | 3.49 | 751.65 | 5.58 |
| 750.13 | 0.00 | 750.64 | 1.37 | 751.15 | 3.49 | 751.66 | 5.78 |
| 750.14 | 0.00 | 750.65 | 1.52 | 751.16 | 3.50 | 751.67 | 5.98 |
| 750.15 | 0.00 | 750.66 | 1.67 | 751.17 | 3.50 | 751.68 | 6.19 |
| 750.16 | 0.00 | 750.67 | 1.83 | 751.18 | 3.50 | 751.69 | 6.40 |
| 750.17 | 0.00 | 750.68 | 2.00 | 751.19 | 3.51 | 751.70 | 6.62 |
| 750.18 | 0.00 | 750.69 | 2.17 | 751.20 | 3.51 | 751.71 | 6.84 |
| 750.19 | 0.00 | 750.70 | 2.34 | 751.21 | 3.52 | 751.72 | 7.07 |
| 750.20 | 0.00 | 750.71 | 2.52 | 751.22 | 3.52 | 751.73 | 7.31 |
| 750.21 | 0.00 | 750.72 | 2.70 | 751.23 | 3.52 | 751.74 | 7.55 |
| 750.22 | 0.00 | 750.73 | 2.89 | 751.24 | 3.53 | 751.75 | 7.79 |
| 750.23 | 0.00 | 750.74 | 3.08 | 751.25 | 3.53 | 751.76 | 8.04 |
| 750.24 | 0.00 | 750.75 | 3.27 | 751.26 | 3.54 | 751.77 | 8.29 |
| 750.25 | 0.00 | 750.76 | 3.33 | 751.27 | 3.54 | 751.78 | 8.55 |
| 750.26 | 0.00 | 750.77 | 3.33 | 751.28 | 3.54 | 751.79 | 8.81 |
| 750.27 | 0.00 | 750.78 | 3.34 | 751.29 | 3.55 | 751.80 | 9.08 |
| 750.28 | 0.00 | 750.79 | 3.34 | 751.30 | 3.55 | 751.81 | 9.35 |
| 750.29 | 0.00 | 750.80 | 3.35 | 751.31 | 3.56 | 751.82 | 9.63 |
| 750.30 | 0.00 | 750.81 | 3.35 | 751.32 | 3.56 | 751.83 | 9.91 |
| 750.31 | 0.00 | 750.82 | 3.36 | 751.33 | 3.56 | 751.84 | 10.19 |
| 750.32 | 0.00 | 750.83 | 3.36 | 751.34 | 3.57 | 751.85 | 10.48 |
| 750.33 | 0.00 | 750.84 | 3.36 | 751.35 | 3.57 | 751.86 | 10.78 |
| 750.34 | 0.00 | 750.85 | 3.37 | 751.36 | 3.58 | 751.87 | 11.07 |
| 750.35 | 0.00 | 750.86 | 3.37 | 751.37 | 3.58 | 751.88 | 11.37 |
| 750.36 | 0.00 | 750.87 | 3.38 | 751.38 | 3.58 | 751.89 | 11.68 |
| 750.37 | 0.00 | 750.88 | 3.38 | 751.39 | 3.59 | 751.90 | 11.98 |
| 750.38 | 0.00 | 750.89 | 3.39 | 751.40 | 3.59 | 751.91 | 12.30 |
| 750.39 | 0.00 | 750.90 | 3.39 | 751.41 | 3.60 | 751.92 | 12.61 |
| 750.40 | 0.00 | 750.91 | 3.39 | 751.42 | 3.60 | 751.93 | 12.93 |
| 750.41 | 0.00 | 750.92 | 3.40 | 751.43 | 3.60 | 751.94 | 13.25 |
| 750.42 | 0.00 | 750.93 | 3.40 | 751.44 | 3.61 | 751.95 | 13.58 |
| 750.43 | 0.00 | 750.94 | 3.41 | 751.45 | 3.61 | 751.96 | 13.91 |
| 750.44 | 0.00 | 750.95 | 3.41 | 751.46 | 3.62 | 751.97 | 14.24 |
| 750.45 | 0.00 | 750.96 | 3.41 | 751.47 | 3.62 | 751.98 | 14.58 |
| 750.46 | 0.00 | 750.97 | 3.42 | 751.48 | 3.62 | 751.99 | 14.92 |
| 750.47 | 0.00 | 750.98 | 3.42 | 751.49 | 3.63 | 752.00 | 15.26 |
| 750.48 | 0.00 | 750.99 | 3.43 | 751.50 | 3.63 | | |
| 750.49 | 0.00 | 751.00 | 3.43 | 751.51 | 3.67 | | |
| 750.50 | 0.00 | 751.01 | 3.43 | 751.52 | 3.73 | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

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Stage-Area-Storage for Pond B-3: Bioretention B-3

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 750.00 | 12,000 | 0 | 751.02 | 18,120 | 15,361 |
| 750.02 | 12,120 | 241 | 751.04 | 18,240 | 15,725 |
| 750.04 | 12,240 | 485 | 751.06 | 18,360 | 16,091 |
| 750.06 | 12,360 | 731 | 751.08 | 18,480 | 16,459 |
| 750.08 | 12,480 | 979 | 751.10 | 18,600 | 16,830 |
| 750.10 | 12,600 | 1,230 | 751.12 | 18,720 | 17,203 |
| 750.12 | 12,720 | 1,483 | 751.14 | 18,840 | 17,579 |
| 750.14 | 12,840 | 1,739 | 751.16 | 18,960 | 17,957 |
| 750.16 | 12,960 | 1,997 | 751.18 | 19,080 | 18,337 |
| 750.18 | 13,080 | 2,257 | 751.20 | 19,200 | 18,720 |
| 750.20 | 13,200 | 2,520 | 751.22 | 19,320 | 19,105 |
| 750.22 | 13,320 | 2,785 | 751.24 | 19,440 | 19,493 |
| 750.24 | 13,440 | 3,053 | 751.26 | 19,560 | 19,883 |
| 750.26 | 13,560 | 3,323 | 751.28 | 19,680 | 20,275 |
| 750.28 | 13,680 | 3,595 | 751.30 | 19,800 | 20,670 |
| 750.30 | 13,800 | 3,870 | 751.32 | 19,920 | 21,067 |
| 750.32 | 13,920 | 4,147 | 751.34 | 20,040 | 21,467 |
| 750.34 | 14,040 | 4,427 | 751.36 | 20,160 | 21,869 |
| 750.36 | 14,160 | 4,709 | 751.38 | 20,280 | 22,273 |
| 750.38 | 14,280 | 4,993 | 751.40 | 20,400 | 22,680 |
| 750.40 | 14,400 | 5,280 | 751.42 | 20,520 | 23,089 |
| 750.42 | 14,520 | 5,569 | 751.44 | 20,640 | 23,501 |
| 750.44 | 14,640 | 5,861 | 751.46 | 20,760 | 23,915 |
| 750.46 | 14,760 | 6,155 | 751.48 | 20,880 | 24,331 |
| 750.48 | 14,880 | 6,451 | 751.50 | 21,000 | 24,750 |
| 750.50 | 15,000 | 6,750 | 751.52 | 21,120 | 25,171 |
| 750.52 | 15,120 | 7,051 | 751.54 | 21,240 | 25,595 |
| 750.54 | 15,240 | 7,355 | 751.56 | 21,360 | 26,021 |
| 750.56 | 15,360 | 7,661 | 751.58 | 21,480 | 26,449 |
| 750.58 | 15,480 | 7,969 | 751.60 | 21,600 | 26,880 |
| 750.60 | 15,600 | 8,280 | 751.62 | 21,720 | 27,313 |
| 750.62 | 15,720 | 8,593 | 751.64 | 21,840 | 27,749 |
| 750.64 | 15,840 | 8,909 | 751.66 | 21,960 | 28,187 |
| 750.66 | 15,960 | 9,227 | 751.68 | 22,080 | 28,627 |
| 750.68 | 16,080 | 9,547 | 751.70 | 22,200 | 29,070 |
| 750.70 | 16,200 | 9,870 | 751.72 | 22,320 | 29,515 |
| 750.72 | 16,320 | 10,195 | 751.74 | 22,440 | 29,963 |
| 750.74 | 16,440 | 10,523 | 751.76 | 22,560 | 30,413 |
| 750.76 | 16,560 | 10,853 | 751.78 | 22,680 | 30,865 |
| 750.78 | 16,680 | 11,185 | 751.80 | 22,800 | 31,320 |
| 750.80 | 16,800 | 11,520 | 751.82 | 22,920 | 31,777 |
| 750.82 | 16,920 | 11,857 | 751.84 | 23,040 | 32,237 |
| 750.84 | 17,040 | 12,197 | 751.86 | 23,160 | 32,699 |
| 750.86 | 17,160 | 12,539 | 751.88 | 23,280 | 33,163 |
| 750.88 | 17,280 | 12,883 | 751.90 | 23,400 | 33,630 |
| 750.90 | 17,400 | 13,230 | 751.92 | 23,520 | 34,099 |
| 750.92 | 17,520 | 13,579 | 751.94 | 23,640 | 34,571 |
| 750.94 | 17,640 | 13,931 | 751.96 | 23,760 | 35,045 |
| 750.96 | 17,760 | 14,285 | 751.98 | 23,880 | 35,521 |
| 750.98 | 17,880 | 14,641 | 752.00 | 24,000 | 36,000 |
| 751.00 | 18,000 | 15,000 | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Pond B-4: Bioretention B-4

Inflow Area = 2.572 ac, 78.93% Impervious, Inflow Depth = 4.57" for 100-yr event
Inflow = 18.14 cfs @ 11.96 hrs, Volume= 0.980 af
Outflow = 10.00 cfs @ 12.06 hrs, Volume= 0.909 af, Atten= 45%, Lag= 5.9 min
Primary = 10.00 cfs @ 12.06 hrs, Volume= 0.909 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 754.74' @ 12.06 hrs Surf.Area= 7,743 sf Storage= 11,978 cf

Plug-Flow detention time= 83.7 min calculated for 0.909 af (93% of inflow)
Center-of-Mass det. time= 42.3 min (810.8 - 768.5)

| Volume | Invert | Avail.Storage | Storage Description |
|---------------------|----------------------|---------------------------|--|
| #1 | 753.00' | 14,000 cf | Surf. Storage (Prismatic) Listed below (Recalc) |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 753.00 | 6,000 | 0 | 0 |
| 755.00 | 8,000 | 14,000 | 14,000 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|---------|--|
| #1 | Primary | 749.50' | 12.0" Round Culvert-Primary L= 230.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 749.50' / 746.50' S= 0.0130 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf |
| #2 | Device 1 | 753.50' | 24.0" x 24.0" Horiz. Grate-Primary C= 0.600 Limited to weir flow at low heads |
| #3 | Primary | 754.50' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=9.70 cfs @ 12.06 hrs HW=754.73' TW=0.00' (Dynamic Tailwater)

- 1=Culvert-Primary (Barrel Controls 6.13 cfs @ 7.80 fps)
- 2=Grate-Primary (Passes 6.13 cfs of 21.36 cfs potential flow)
- 3=Sharp-Crested Rectangular Weir (Weir Controls 3.58 cfs @ 1.57 fps)

Proposed Conditions I

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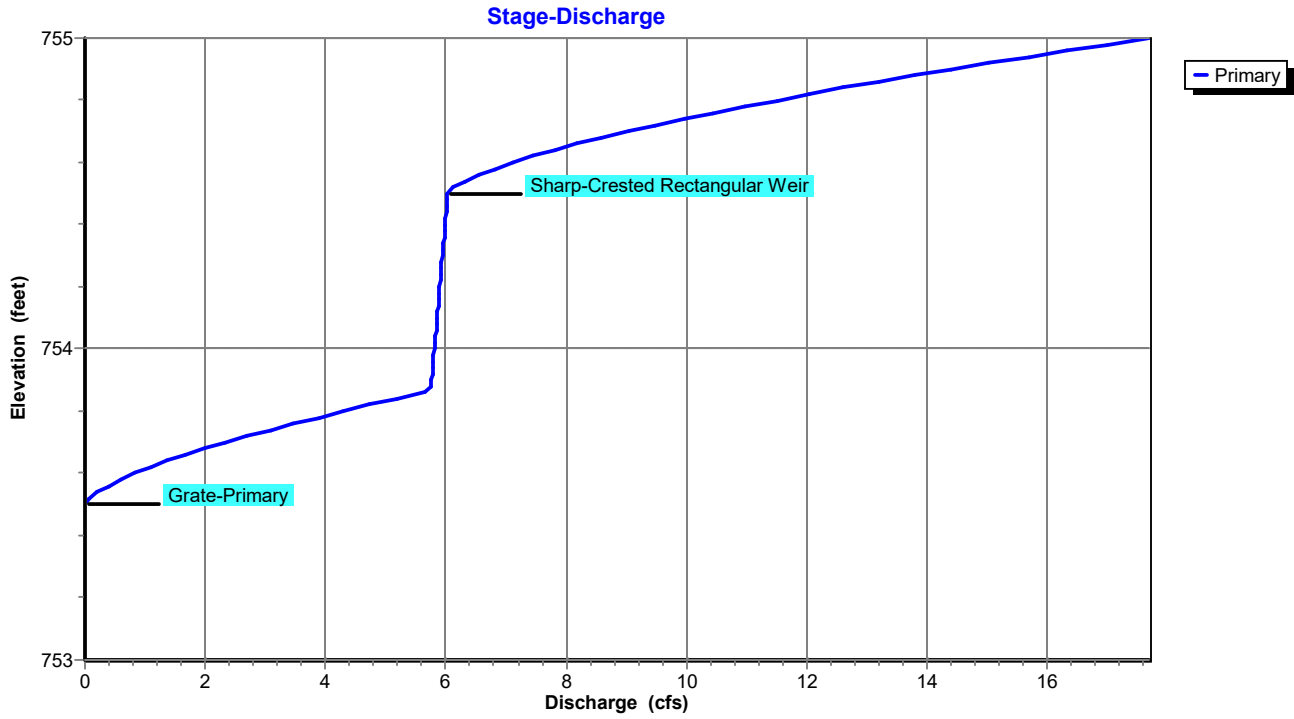
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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

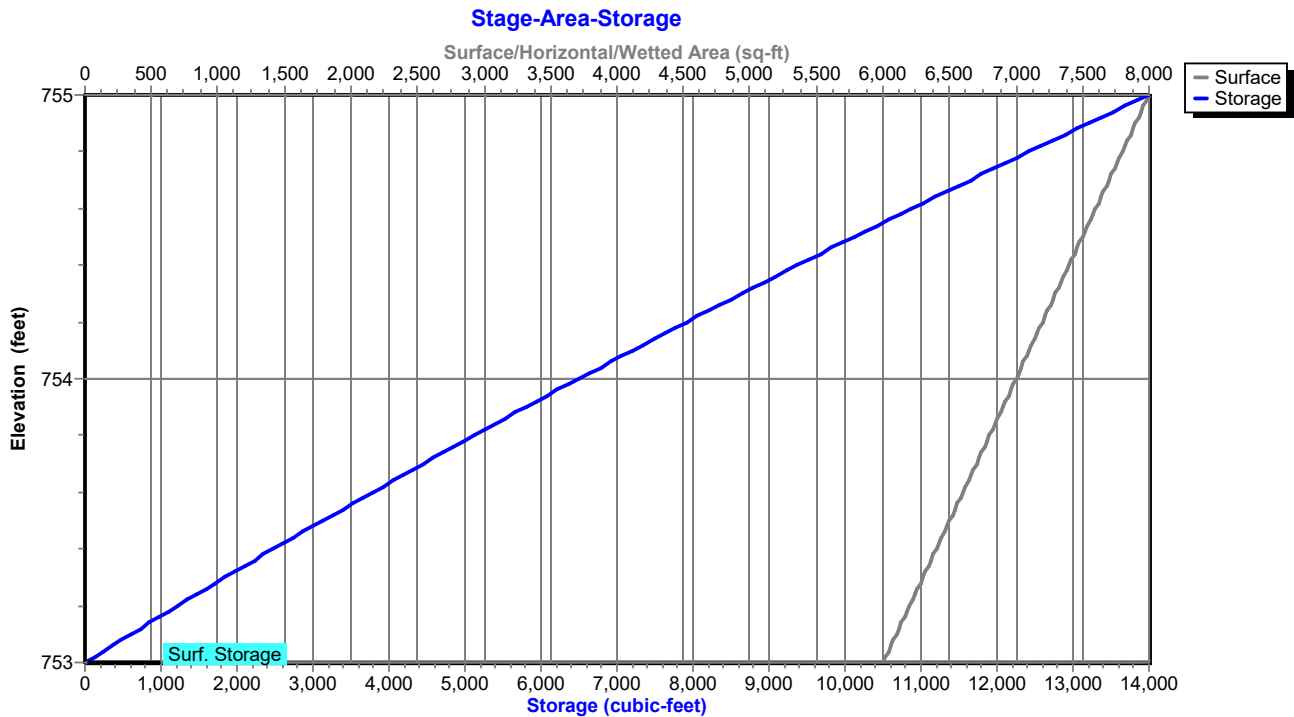
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Pond B-4: Bioretention B-4



Pond B-4: Bioretention B-4



Proposed Conditions I

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Proposed Conditions - I

Type II 24-hr 100-yr Rainfall=5.27"

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Stage-Discharge for Pond B-4: Bioretention B-4

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|
| 753.00 | 0.00 | 753.51 | 0.03 | 754.02 | 5.82 | 754.53 | 6.21 |
| 753.01 | 0.00 | 753.52 | 0.07 | 754.03 | 5.82 | 754.54 | 6.31 |
| 753.02 | 0.00 | 753.53 | 0.14 | 754.04 | 5.83 | 754.55 | 6.41 |
| 753.03 | 0.00 | 753.54 | 0.21 | 754.05 | 5.83 | 754.56 | 6.53 |
| 753.04 | 0.00 | 753.55 | 0.29 | 754.06 | 5.84 | 754.57 | 6.66 |
| 753.05 | 0.00 | 753.56 | 0.38 | 754.07 | 5.84 | 754.58 | 6.80 |
| 753.06 | 0.00 | 753.57 | 0.48 | 754.08 | 5.84 | 754.59 | 6.95 |
| 753.07 | 0.00 | 753.58 | 0.59 | 754.09 | 5.85 | 754.60 | 7.10 |
| 753.08 | 0.00 | 753.59 | 0.71 | 754.10 | 5.85 | 754.61 | 7.27 |
| 753.09 | 0.00 | 753.60 | 0.83 | 754.11 | 5.86 | 754.62 | 7.44 |
| 753.10 | 0.00 | 753.61 | 0.95 | 754.12 | 5.86 | 754.63 | 7.61 |
| 753.11 | 0.00 | 753.62 | 1.09 | 754.13 | 5.87 | 754.64 | 7.80 |
| 753.12 | 0.00 | 753.63 | 1.23 | 754.14 | 5.87 | 754.65 | 7.99 |
| 753.13 | 0.00 | 753.64 | 1.37 | 754.15 | 5.88 | 754.66 | 8.18 |
| 753.14 | 0.00 | 753.65 | 1.52 | 754.16 | 5.88 | 754.67 | 8.38 |
| 753.15 | 0.00 | 753.66 | 1.67 | 754.17 | 5.88 | 754.68 | 8.59 |
| 753.16 | 0.00 | 753.67 | 1.83 | 754.18 | 5.89 | 754.69 | 8.81 |
| 753.17 | 0.00 | 753.68 | 2.00 | 754.19 | 5.89 | 754.70 | 9.03 |
| 753.18 | 0.00 | 753.69 | 2.17 | 754.20 | 5.90 | 754.71 | 9.25 |
| 753.19 | 0.00 | 753.70 | 2.34 | 754.21 | 5.90 | 754.72 | 9.48 |
| 753.20 | 0.00 | 753.71 | 2.52 | 754.22 | 5.91 | 754.73 | 9.72 |
| 753.21 | 0.00 | 753.72 | 2.70 | 754.23 | 5.91 | 754.74 | 9.96 |
| 753.22 | 0.00 | 753.73 | 2.89 | 754.24 | 5.91 | 754.75 | 10.20 |
| 753.23 | 0.00 | 753.74 | 3.08 | 754.25 | 5.92 | 754.76 | 10.45 |
| 753.24 | 0.00 | 753.75 | 3.27 | 754.26 | 5.92 | 754.77 | 10.71 |
| 753.25 | 0.00 | 753.76 | 3.47 | 754.27 | 5.93 | 754.78 | 10.96 |
| 753.26 | 0.00 | 753.77 | 3.67 | 754.28 | 5.93 | 754.79 | 11.23 |
| 753.27 | 0.00 | 753.78 | 3.88 | 754.29 | 5.94 | 754.80 | 11.50 |
| 753.28 | 0.00 | 753.79 | 4.09 | 754.30 | 5.94 | 754.81 | 11.77 |
| 753.29 | 0.00 | 753.80 | 4.30 | 754.31 | 5.95 | 754.82 | 12.05 |
| 753.30 | 0.00 | 753.81 | 4.52 | 754.32 | 5.95 | 754.83 | 12.33 |
| 753.31 | 0.00 | 753.82 | 4.74 | 754.33 | 5.95 | 754.84 | 12.61 |
| 753.32 | 0.00 | 753.83 | 4.96 | 754.34 | 5.96 | 754.85 | 12.90 |
| 753.33 | 0.00 | 753.84 | 5.19 | 754.35 | 5.96 | 754.86 | 13.19 |
| 753.34 | 0.00 | 753.85 | 5.42 | 754.36 | 5.97 | 754.87 | 13.49 |
| 753.35 | 0.00 | 753.86 | 5.65 | 754.37 | 5.97 | 754.88 | 13.79 |
| 753.36 | 0.00 | 753.87 | 5.75 | 754.38 | 5.98 | 754.89 | 14.10 |
| 753.37 | 0.00 | 753.88 | 5.75 | 754.39 | 5.98 | 754.90 | 14.40 |
| 753.38 | 0.00 | 753.89 | 5.76 | 754.40 | 5.98 | 754.91 | 14.72 |
| 753.39 | 0.00 | 753.90 | 5.76 | 754.41 | 5.99 | 754.92 | 15.03 |
| 753.40 | 0.00 | 753.91 | 5.77 | 754.42 | 5.99 | 754.93 | 15.35 |
| 753.41 | 0.00 | 753.92 | 5.77 | 754.43 | 6.00 | 754.94 | 15.67 |
| 753.42 | 0.00 | 753.93 | 5.78 | 754.44 | 6.00 | 754.95 | 16.00 |
| 753.43 | 0.00 | 753.94 | 5.78 | 754.45 | 6.01 | 754.96 | 16.33 |
| 753.44 | 0.00 | 753.95 | 5.79 | 754.46 | 6.01 | 754.97 | 16.66 |
| 753.45 | 0.00 | 753.96 | 5.79 | 754.47 | 6.01 | 754.98 | 17.00 |
| 753.46 | 0.00 | 753.97 | 5.80 | 754.48 | 6.02 | 754.99 | 17.34 |
| 753.47 | 0.00 | 753.98 | 5.80 | 754.49 | 6.02 | 755.00 | 17.68 |
| 753.48 | 0.00 | 753.99 | 5.80 | 754.50 | 6.03 | | |
| 753.49 | 0.00 | 754.00 | 5.81 | 754.51 | 6.06 | | |
| 753.50 | 0.00 | 754.01 | 5.81 | 754.52 | 6.13 | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

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Stage-Area-Storage for Pond B-4: Bioretention B-4

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 753.00 | 6,000 | 0 | 754.02 | 7,020 | 6,640 |
| 753.02 | 6,020 | 120 | 754.04 | 7,040 | 6,781 |
| 753.04 | 6,040 | 241 | 754.06 | 7,060 | 6,922 |
| 753.06 | 6,060 | 362 | 754.08 | 7,080 | 7,063 |
| 753.08 | 6,080 | 483 | 754.10 | 7,100 | 7,205 |
| 753.10 | 6,100 | 605 | 754.12 | 7,120 | 7,347 |
| 753.12 | 6,120 | 727 | 754.14 | 7,140 | 7,490 |
| 753.14 | 6,140 | 850 | 754.16 | 7,160 | 7,633 |
| 753.16 | 6,160 | 973 | 754.18 | 7,180 | 7,776 |
| 753.18 | 6,180 | 1,096 | 754.20 | 7,200 | 7,920 |
| 753.20 | 6,200 | 1,220 | 754.22 | 7,220 | 8,064 |
| 753.22 | 6,220 | 1,344 | 754.24 | 7,240 | 8,209 |
| 753.24 | 6,240 | 1,469 | 754.26 | 7,260 | 8,354 |
| 753.26 | 6,260 | 1,594 | 754.28 | 7,280 | 8,499 |
| 753.28 | 6,280 | 1,719 | 754.30 | 7,300 | 8,645 |
| 753.30 | 6,300 | 1,845 | 754.32 | 7,320 | 8,791 |
| 753.32 | 6,320 | 1,971 | 754.34 | 7,340 | 8,938 |
| 753.34 | 6,340 | 2,098 | 754.36 | 7,360 | 9,085 |
| 753.36 | 6,360 | 2,225 | 754.38 | 7,380 | 9,232 |
| 753.38 | 6,380 | 2,352 | 754.40 | 7,400 | 9,380 |
| 753.40 | 6,400 | 2,480 | 754.42 | 7,420 | 9,528 |
| 753.42 | 6,420 | 2,608 | 754.44 | 7,440 | 9,677 |
| 753.44 | 6,440 | 2,737 | 754.46 | 7,460 | 9,826 |
| 753.46 | 6,460 | 2,866 | 754.48 | 7,480 | 9,975 |
| 753.48 | 6,480 | 2,995 | 754.50 | 7,500 | 10,125 |
| 753.50 | 6,500 | 3,125 | 754.52 | 7,520 | 10,275 |
| 753.52 | 6,520 | 3,255 | 754.54 | 7,540 | 10,426 |
| 753.54 | 6,540 | 3,386 | 754.56 | 7,560 | 10,577 |
| 753.56 | 6,560 | 3,517 | 754.58 | 7,580 | 10,728 |
| 753.58 | 6,580 | 3,648 | 754.60 | 7,600 | 10,880 |
| 753.60 | 6,600 | 3,780 | 754.62 | 7,620 | 11,032 |
| 753.62 | 6,620 | 3,912 | 754.64 | 7,640 | 11,185 |
| 753.64 | 6,640 | 4,045 | 754.66 | 7,660 | 11,338 |
| 753.66 | 6,660 | 4,178 | 754.68 | 7,680 | 11,491 |
| 753.68 | 6,680 | 4,311 | 754.70 | 7,700 | 11,645 |
| 753.70 | 6,700 | 4,445 | 754.72 | 7,720 | 11,799 |
| 753.72 | 6,720 | 4,579 | 754.74 | 7,740 | 11,954 |
| 753.74 | 6,740 | 4,714 | 754.76 | 7,760 | 12,109 |
| 753.76 | 6,760 | 4,849 | 754.78 | 7,780 | 12,264 |
| 753.78 | 6,780 | 4,984 | 754.80 | 7,800 | 12,420 |
| 753.80 | 6,800 | 5,120 | 754.82 | 7,820 | 12,576 |
| 753.82 | 6,820 | 5,256 | 754.84 | 7,840 | 12,733 |
| 753.84 | 6,840 | 5,393 | 754.86 | 7,860 | 12,890 |
| 753.86 | 6,860 | 5,530 | 754.88 | 7,880 | 13,047 |
| 753.88 | 6,880 | 5,667 | 754.90 | 7,900 | 13,205 |
| 753.90 | 6,900 | 5,805 | 754.92 | 7,920 | 13,363 |
| 753.92 | 6,920 | 5,943 | 754.94 | 7,940 | 13,522 |
| 753.94 | 6,940 | 6,082 | 754.96 | 7,960 | 13,681 |
| 753.96 | 6,960 | 6,221 | 754.98 | 7,980 | 13,840 |
| 753.98 | 6,980 | 6,360 | 755.00 | 8,000 | 14,000 |
| 754.00 | 7,000 | 6,500 | | | |

Proposed Conditions I

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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Pond P-1: Wet Pond P-1

Inflow Area = 22.268 ac, 71.72% Impervious, Inflow Depth = 3.77" for 100-yr event
 Inflow = 82.61 cfs @ 11.98 hrs, Volume= 7.004 af
 Outflow = 50.42 cfs @ 12.07 hrs, Volume= 6.995 af, Atten= 39%, Lag= 5.9 min
 Primary = 50.42 cfs @ 12.07 hrs, Volume= 6.995 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Peak Elev= 750.04' @ 12.07 hrs Surf.Area= 50,663 sf Storage= 92,210 cf

Plug-Flow detention time= 213.6 min calculated for 6.995 af (100% of inflow)
 Center-of-Mass det. time= 212.5 min (1,028.8 - 816.4)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|--|
| #1 | 740.00' | 0 cf | Retention (Irregular) Listed below (Recalc) 24,499 cf Overall x 0.0% Voids |
| #2 | 746.00' | 133,484 cf | Detention (Irregular) Listed below (Recalc) |
| | | 133,484 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|------------------|-------------------|---------------|------------------------|------------------------|------------------|
| 740.00 | 651 | 103.0 | 0 | 0 | 651 |
| 741.50 | 2,244 | 1,016.0 | 2,052 | 2,052 | 81,955 |
| 745.00 | 4,383 | 391.0 | 11,390 | 13,442 | 151,977 |
| 746.50 | 10,839 | 632.0 | 11,057 | 24,499 | 171,611 |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|------------------|-------------------|---------------|------------------------|------------------------|------------------|
| 746.00 | 11,459 | 563.0 | 0 | 0 | 11,459 |
| 747.00 | 13,760 | 587.0 | 12,592 | 12,592 | 13,729 |
| 748.00 | 19,120 | 930.0 | 16,367 | 28,959 | 55,143 |
| 749.00 | 32,528 | 1,810.0 | 25,529 | 54,488 | 247,025 |
| 750.00 | 39,522 | 1,836.0 | 35,968 | 90,456 | 254,786 |
| 751.00 | 46,632 | 1,863.0 | 43,028 | 133,484 | 262,946 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|---------|--|
| #1 | Primary | 742.25' | 30.0" Round Culvert L= 85.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 742.25' / 742.09' S= 0.0019 '/ Cc= 0.900 n= 0.012, Flow Area= 4.91 sf |
| #2 | Device 1 | 748.65' | 30.0" W x 30.0" H 9° Grate C= 0.600 Limited to weir flow at low heads |
| #3 | Primary | 749.65' | 20.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |
| #4 | Device 1 | 746.00' | 6.0" Round Culvert-Low Flow L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 745.50' / 746.00' S= -0.0333 '/ Cc= 0.900 n= 0.012, Flow Area= 0.20 sf |

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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

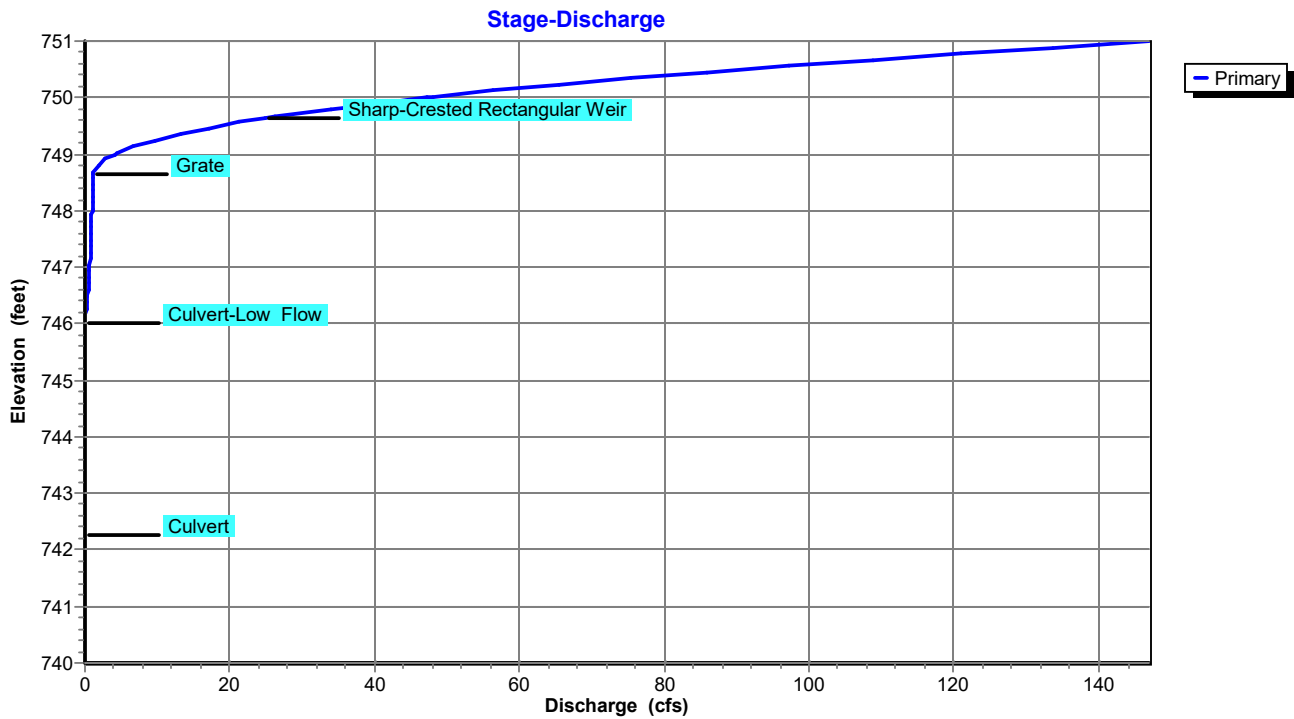
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Primary OutFlow Max=49.44 cfs @ 12.07 hrs HW=750.03' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 34.17 cfs of 60.40 cfs potential flow)
- 2=Grate (Orifice Controls 32.72 cfs @ 5.23 fps)
- 4=Culvert-Low Flow (Inlet Controls 1.45 cfs @ 7.39 fps)
- 3=Sharp-Crested Rectangular Weir (Weir Controls 15.27 cfs @ 2.02 fps)

Pond P-1: Wet Pond P-1



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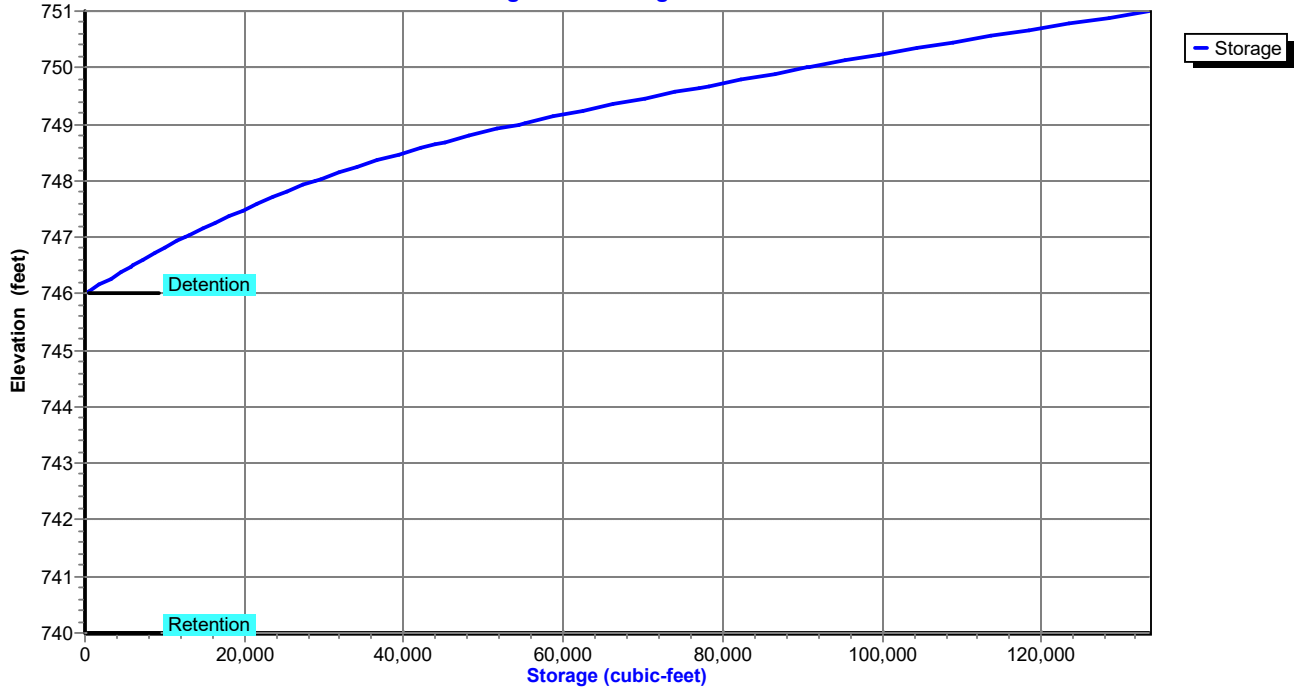
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Type II 24-hr 100-yr Rainfall=5.27"

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Pond P-1: Wet Pond P-1

Stage-Area-Storage



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Type II 24-hr 100-yr Rainfall=5.27"

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Stage-Discharge for Pond P-1: Wet Pond P-1

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|
| 740.00 | 0.00 | 743.06 | 0.00 | 746.12 | 0.03 | 749.18 | 7.99 |
| 740.06 | 0.00 | 743.12 | 0.00 | 746.18 | 0.07 | 749.24 | 9.69 |
| 740.12 | 0.00 | 743.18 | 0.00 | 746.24 | 0.12 | 749.30 | 11.54 |
| 740.18 | 0.00 | 743.24 | 0.00 | 746.30 | 0.18 | 749.36 | 13.52 |
| 740.24 | 0.00 | 743.30 | 0.00 | 746.36 | 0.24 | 749.42 | 15.63 |
| 740.30 | 0.00 | 743.36 | 0.00 | 746.42 | 0.31 | 749.48 | 17.85 |
| 740.36 | 0.00 | 743.42 | 0.00 | 746.48 | 0.36 | 749.54 | 20.19 |
| 740.42 | 0.00 | 743.48 | 0.00 | 746.54 | 0.40 | 749.60 | 22.63 |
| 740.48 | 0.00 | 743.54 | 0.00 | 746.60 | 0.44 | 749.66 | 25.23 |
| 740.54 | 0.00 | 743.60 | 0.00 | 746.66 | 0.48 | 749.72 | 29.02 |
| 740.60 | 0.00 | 743.66 | 0.00 | 746.72 | 0.51 | 749.78 | 33.50 |
| 740.66 | 0.00 | 743.72 | 0.00 | 746.78 | 0.54 | 749.84 | 36.78 |
| 740.72 | 0.00 | 743.78 | 0.00 | 746.84 | 0.57 | 749.90 | 40.44 |
| 740.78 | 0.00 | 743.84 | 0.00 | 746.90 | 0.60 | 749.96 | 44.42 |
| 740.84 | 0.00 | 743.90 | 0.00 | 746.96 | 0.63 | 750.02 | 48.69 |
| 740.90 | 0.00 | 743.96 | 0.00 | 747.02 | 0.65 | 750.08 | 53.22 |
| 740.96 | 0.00 | 744.02 | 0.00 | 747.08 | 0.68 | 750.14 | 58.00 |
| 741.02 | 0.00 | 744.08 | 0.00 | 747.14 | 0.70 | 750.20 | 63.01 |
| 741.08 | 0.00 | 744.14 | 0.00 | 747.20 | 0.73 | 750.26 | 68.22 |
| 741.14 | 0.00 | 744.20 | 0.00 | 747.26 | 0.75 | 750.32 | 73.65 |
| 741.20 | 0.00 | 744.26 | 0.00 | 747.32 | 0.77 | 750.38 | 79.26 |
| 741.26 | 0.00 | 744.32 | 0.00 | 747.38 | 0.79 | 750.44 | 85.06 |
| 741.32 | 0.00 | 744.38 | 0.00 | 747.44 | 0.81 | 750.50 | 91.04 |
| 741.38 | 0.00 | 744.44 | 0.00 | 747.50 | 0.83 | 750.56 | 97.19 |
| 741.44 | 0.00 | 744.50 | 0.00 | 747.56 | 0.85 | 750.62 | 103.50 |
| 741.50 | 0.00 | 744.56 | 0.00 | 747.62 | 0.87 | 750.68 | 109.97 |
| 741.56 | 0.00 | 744.62 | 0.00 | 747.68 | 0.89 | 750.74 | 116.60 |
| 741.62 | 0.00 | 744.68 | 0.00 | 747.74 | 0.91 | 750.80 | 123.37 |
| 741.68 | 0.00 | 744.74 | 0.00 | 747.80 | 0.93 | 750.86 | 130.29 |
| 741.74 | 0.00 | 744.80 | 0.00 | 747.86 | 0.95 | 750.92 | 137.35 |
| 741.80 | 0.00 | 744.86 | 0.00 | 747.92 | 0.96 | 750.98 | 144.55 |
| 741.86 | 0.00 | 744.92 | 0.00 | 747.98 | 0.98 | | |
| 741.92 | 0.00 | 744.98 | 0.00 | 748.04 | 1.00 | | |
| 741.98 | 0.00 | 745.04 | 0.00 | 748.10 | 1.02 | | |
| 742.04 | 0.00 | 745.10 | 0.00 | 748.16 | 1.03 | | |
| 742.10 | 0.00 | 745.16 | 0.00 | 748.22 | 1.05 | | |
| 742.16 | 0.00 | 745.22 | 0.00 | 748.28 | 1.06 | | |
| 742.22 | 0.00 | 745.28 | 0.00 | 748.34 | 1.08 | | |
| 742.28 | 0.00 | 745.34 | 0.00 | 748.40 | 1.09 | | |
| 742.34 | 0.00 | 745.40 | 0.00 | 748.46 | 1.11 | | |
| 742.40 | 0.00 | 745.46 | 0.00 | 748.52 | 1.12 | | |
| 742.46 | 0.00 | 745.52 | 0.00 | 748.58 | 1.14 | | |
| 742.52 | 0.00 | 745.58 | 0.00 | 748.64 | 1.15 | | |
| 742.58 | 0.00 | 745.64 | 0.00 | 748.70 | 1.27 | | |
| 742.64 | 0.00 | 745.70 | 0.00 | 748.76 | 1.54 | | |
| 742.70 | 0.00 | 745.76 | 0.00 | 748.82 | 1.95 | | |
| 742.76 | 0.00 | 745.82 | 0.00 | 748.88 | 2.51 | | |
| 742.82 | 0.00 | 745.88 | 0.00 | 748.94 | 3.21 | | |
| 742.88 | 0.00 | 745.94 | 0.00 | 749.00 | 4.07 | | |
| 742.94 | 0.00 | 746.00 | 0.00 | 749.06 | 5.12 | | |
| 743.00 | 0.00 | 746.06 | 0.01 | 749.12 | 6.46 | | |

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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

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Stage-Area-Storage for Pond P-1: Wet Pond P-1

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---------------------|-------------------------|---------------------|-------------------------|
| 740.00 | 0 | 747.65 | 22,616 |
| 740.15 | 0 | 747.80 | 25,249 |
| 740.30 | 0 | 747.95 | 28,010 |
| 740.45 | 0 | 748.10 | 30,929 |
| 740.60 | 0 | 748.25 | 34,112 |
| 740.75 | 0 | 748.40 | 37,575 |
| 740.90 | 0 | 748.55 | 41,333 |
| 741.05 | 0 | 748.70 | 45,396 |
| 741.20 | 0 | 748.85 | 49,777 |
| 741.35 | 0 | 749.00 | 54,488 |
| 741.50 | 0 | 749.15 | 59,442 |
| 741.65 | 0 | 749.30 | 64,548 |
| 741.80 | 0 | 749.45 | 69,809 |
| 741.95 | 0 | 749.60 | 75,227 |
| 742.10 | 0 | 749.75 | 80,803 |
| 742.25 | 0 | 749.90 | 86,540 |
| 742.40 | 0 | 750.05 | 92,440 |
| 742.55 | 0 | 750.20 | 98,497 |
| 742.70 | 0 | 750.35 | 104,710 |
| 742.85 | 0 | 750.50 | 111,081 |
| 743.00 | 0 | 750.65 | 117,612 |
| 743.15 | 0 | 750.80 | 124,305 |
| 743.30 | 0 | 750.95 | 131,161 |
| 743.45 | 0 | | |
| 743.60 | 0 | | |
| 743.75 | 0 | | |
| 743.90 | 0 | | |
| 744.05 | 0 | | |
| 744.20 | 0 | | |
| 744.35 | 0 | | |
| 744.50 | 0 | | |
| 744.65 | 0 | | |
| 744.80 | 0 | | |
| 744.95 | 0 | | |
| 745.10 | 0 | | |
| 745.25 | 0 | | |
| 745.40 | 0 | | |
| 745.55 | 0 | | |
| 745.70 | 0 | | |
| 745.85 | 0 | | |
| 746.00 | 0 | | |
| 746.15 | 1,744 | | |
| 746.30 | 3,537 | | |
| 746.45 | 5,382 | | |
| 746.60 | 7,278 | | |
| 746.75 | 9,227 | | |
| 746.90 | 11,228 | | |
| 747.05 | 13,286 | | |
| 747.20 | 15,444 | | |
| 747.35 | 17,716 | | |
| 747.50 | 20,105 | | |

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Proposed Conditions - I

Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Link 1AT: DA #1A Total

Inflow Area = 56.205 ac, 63.22% Impervious, Inflow Depth = 4.14" for 100-yr event
Inflow = 158.96 cfs @ 12.17 hrs, Volume= 19.402 af
Primary = 158.96 cfs @ 12.17 hrs, Volume= 19.402 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Link DP-1: DP #1 - Rush Crk Trib.

Inflow Area = 56.205 ac, 63.22% Impervious, Inflow Depth = 4.14" for 100-yr event
Inflow = 158.96 cfs @ 12.17 hrs, Volume= 19.402 af
Primary = 158.96 cfs @ 12.17 hrs, Volume= 19.402 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Link DP-2: DP #2 - Smokes Crk

Inflow Area = 83.814 ac, 88.53% Impervious, Inflow Depth > 4.79" for 100-yr event
Inflow = 335.55 cfs @ 12.03 hrs, Volume= 33.468 af
Primary = 335.55 cfs @ 12.03 hrs, Volume= 33.468 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

100-yr Primary Outflow Imported from Proposed Conditions II~Link DP-2.hce

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Proposed Conditions - I
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Link DP-3: DP #3 - Rush Crk

Inflow Area = 55.981 ac, 45.79% Impervious, Inflow Depth > 3.90" for 100-yr event
Inflow = 123.65 cfs @ 12.33 hrs, Volume= 18.201 af
Primary = 123.65 cfs @ 12.33 hrs, Volume= 18.201 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

100-yr Primary Outflow Imported from Proposed Conditions III~Link DP-3.hce

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Type II 24-hr 100-yr Rainfall=5.27"

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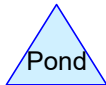
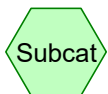
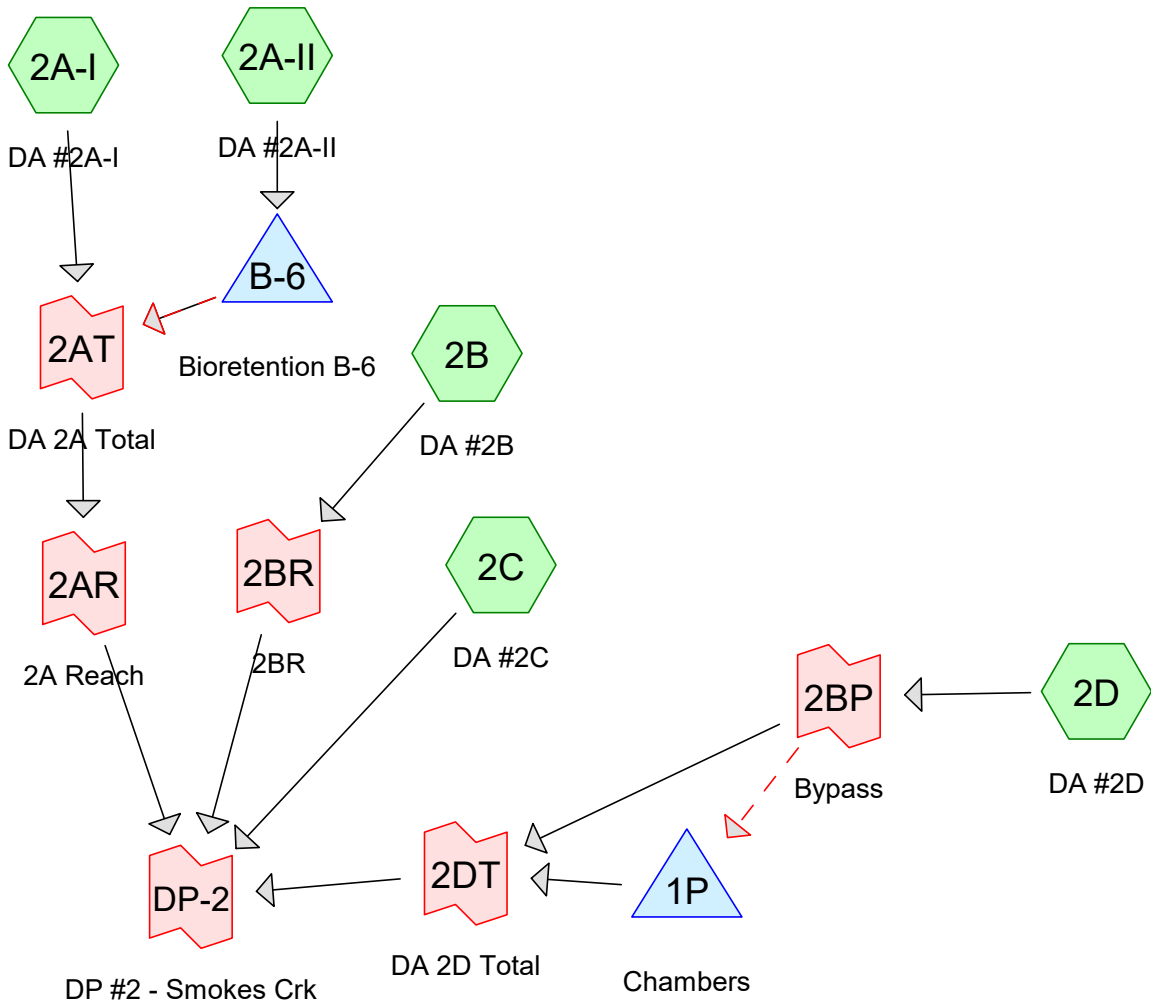
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Summary for Link PT: Proposed Conditions Total Offsite

Inflow Area = 196.000 ac, 69.06% Impervious, Inflow Depth > 4.35" for 100-yr event
Inflow = 541.90 cfs @ 12.16 hrs, Volume= 71.071 af
Primary = 541.90 cfs @ 12.16 hrs, Volume= 71.071 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

Proposed Conditions - Report II of III, Drainage Area #2



Routing Diagram for Proposed Conditions II
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Proposed Conditions II

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Proposed Conditions - II
Type II 24-hr 1-yr Rainfall=1.84"

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Page 2

Summary for Subcatchment 2A-I: DA #2A-I

Runoff = 60.68 cfs @ 12.12 hrs, Volume= 4.736 af, Depth= 1.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.883 | 74 | >75% Grass cover, Good, HSG C |
| 3.754 | 80 | >75% Grass cover, Good, HSG D |
| 5.748 | 98 | Paved parking, HSG C |
| 29.010 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.632 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 40.027 | 96 | Weighted Average |
| 5.269 | | 13.16% Pervious Area |
| 34.758 | | 86.84% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 1.9 | 98 | 0.0100 | 0.86 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 13.7 | 65 | 0.0150 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 0.8 | 80 | 0.0100 | 1.61 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 2.1 | 320 | 0.0150 | 2.49 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 1.7 | 446 | | 4.50 | | Direct Entry, Pipe Flow |
| 20.2 | 1,009 | Total | | | |

Proposed Conditions II

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Proposed Conditions - II
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Subcatchment 2A-II: DA #2A-II

Runoff = 6.84 cfs @ 11.96 hrs, Volume= 0.353 af, Depth= 1.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.400 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 2.580 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 2.980 | 96 | Weighted Average |
| 0.400 | | 13.42% Pervious Area |
| 2.580 | | 86.58% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.6 | 100 | 0.0150 | 1.02 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 3.0 | 450 | 0.0150 | 2.49 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 4.6 | 550 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - II
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Subcatchment 2B: DA #2B

Runoff = 29.40 cfs @ 11.96 hrs, Volume= 1.599 af, Depth= 1.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.000 | 80 | >75% Grass cover, Good, HSG D |
| 2.682 | 98 | Paved parking, HSG C |
| 9.190 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 11.872 | 98 | Weighted Average |
| 11.872 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.9 | 100 | 0.0100 | 0.86 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 1.6 | 200 | 0.0100 | 2.03 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 3.5 | 300 | | | | Total, Increased to minimum Tc = 6.0 min |

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Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Subcatchment 2C: DA #2C

Runoff = 20.20 cfs @ 11.97 hrs, Volume= 0.984 af, Depth= 1.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.913 | 74 | >75% Grass cover, Good, HSG C |
| 2.316 | 80 | >75% Grass cover, Good, HSG D |
| 1.729 | 98 | Paved parking, HSG C |
| 5.964 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.595 | 77 | Woods, Good, HSG D |
| 11.517 | 91 | Weighted Average |
| 3.824 | | 33.20% Pervious Area |
| 7.693 | | 66.80% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.9 | 100 | 0.0100 | 0.86 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 1.6 | 200 | 0.0100 | 2.03 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 3.5 | 300 | | | | Total, Increased to minimum Tc = 6.0 min |

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Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Subcatchment 2D: DA #2D

Runoff = 43.13 cfs @ 11.96 hrs, Volume= 2.345 af, Depth= 1.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.118 | 80 | >75% Grass cover, Good, HSG D |
| 10.554 | 98 | Paved parking, HSG C |
| 6.746 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 17.418 | 98 | Weighted Average |
| 0.118 | | 0.68% Pervious Area |
| 17.300 | | 99.32% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|--|-------------------|----------------|--|
| 1.9 | 98 | 0.0100 | 0.86 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 1.7 | 446 | | 4.50 | | Direct Entry, Pipe Flow |
| 3.6 | 544 | Total, Increased to minimum Tc = 6.0 min | | | |

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Proposed Conditions - II
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Pond 1P: Chambers

Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 748.00' @ 1.00 hrs Surf.Area= 5,210 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|---|
| #1A | 748.00' | 5,151 cf | 58.50'W x 89.06'L x 3.75'H Field A 19,537 cf Overall - 6,658 cf Embedded = 12,878 cf x 40.0% Voids |
| #2A | 748.75' | 6,658 cf | ADS_StormTech DC-780 +Cap x 144 Inside #1 Effective Size= 45.4"W x 30.0"H => 6.49 sf x 7.12'L = 46.2 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 144 Chambers in 12 Rows |
| | | 11,810 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

| Device | Routing | Invert | Outlet Devices |
|--------|---------|---------|--|
| #1 | Primary | 748.00' | 36.0" Round Culvert L= 165.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 748.00' / 747.35' S= 0.0039 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf |

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=748.00' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Controls 0.00 cfs)

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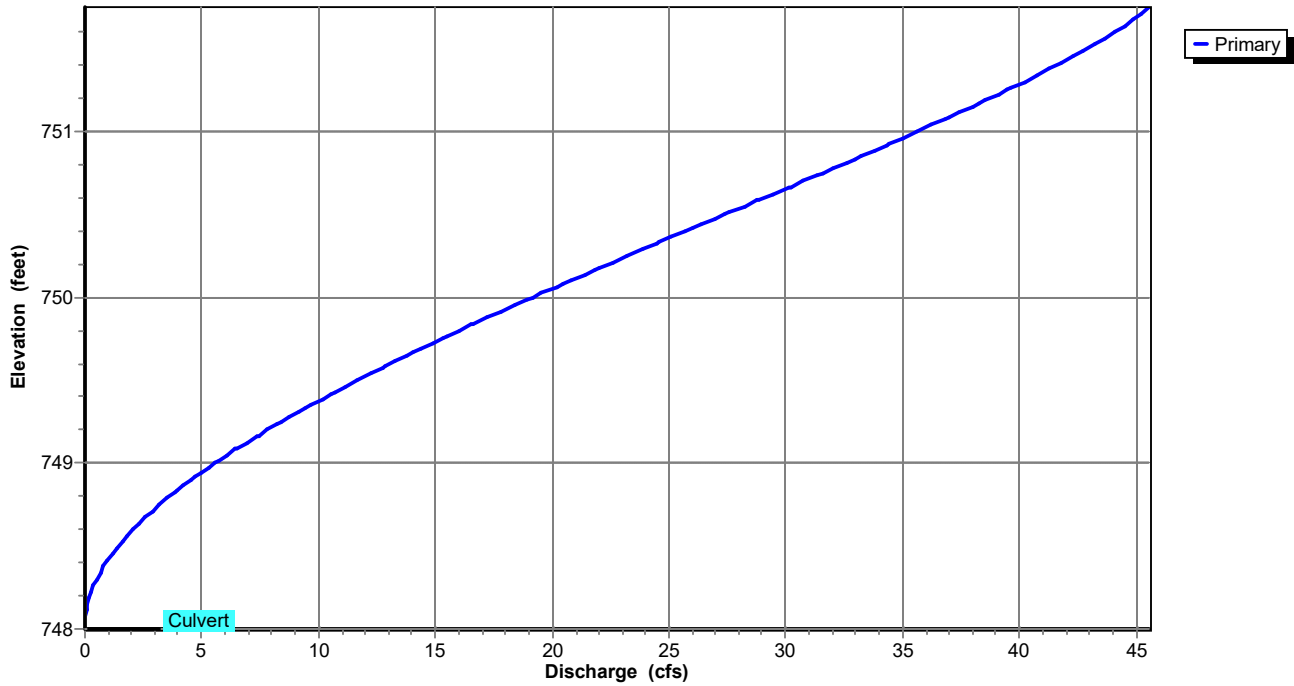
Proposed Conditions - II
Type II 24-hr 1-yr Rainfall=1.84"

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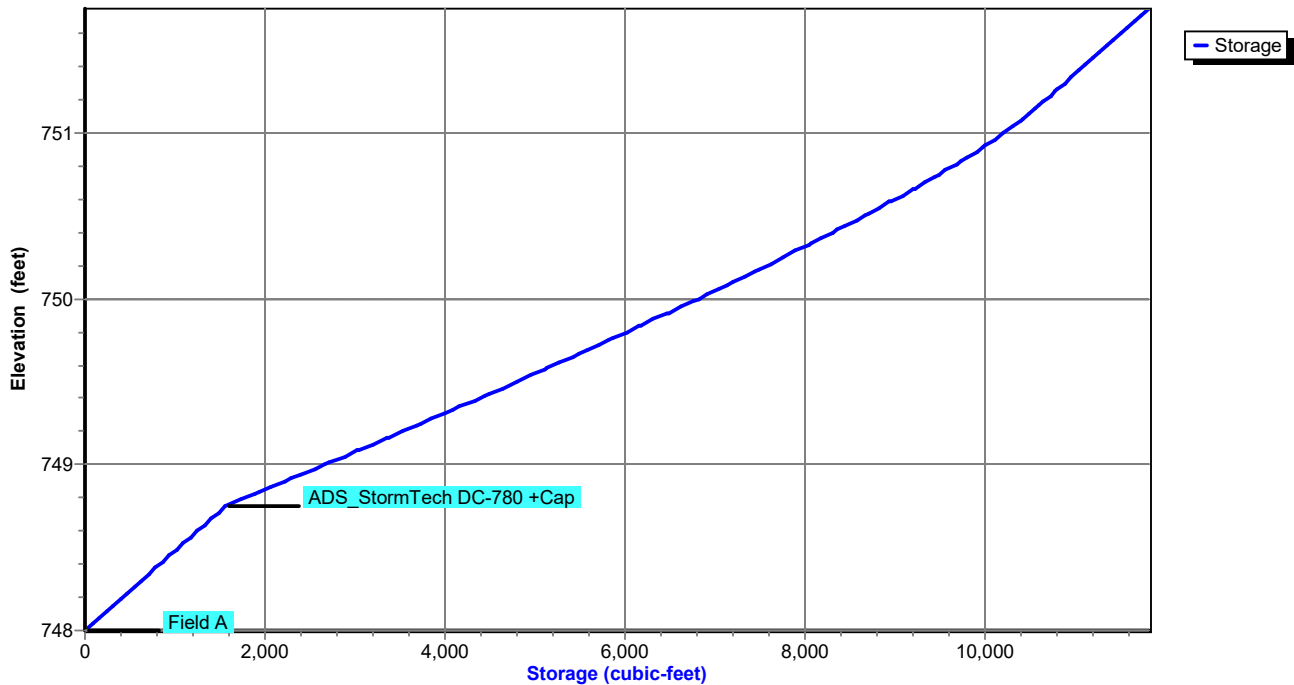
Pond 1P: Chambers

Stage-Discharge



Pond 1P: Chambers

Stage-Area-Storage



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Type II 24-hr 1-yr Rainfall=1.84"

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Stage-Discharge for Pond 1P: Chambers

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|
| 748.00 | 0.00 | 749.02 | 5.77 | 750.04 | 19.80 | 751.06 | 36.60 |
| 748.02 | 0.00 | 749.04 | 5.99 | 750.06 | 20.12 | 751.08 | 36.91 |
| 748.04 | 0.01 | 749.06 | 6.20 | 750.08 | 20.44 | 751.10 | 37.22 |
| 748.06 | 0.02 | 749.08 | 6.42 | 750.10 | 20.76 | 751.12 | 37.53 |
| 748.08 | 0.03 | 749.10 | 6.65 | 750.12 | 21.09 | 751.14 | 37.84 |
| 748.10 | 0.05 | 749.12 | 6.87 | 750.14 | 21.41 | 751.16 | 38.14 |
| 748.12 | 0.07 | 749.14 | 7.10 | 750.16 | 21.74 | 751.18 | 38.45 |
| 748.14 | 0.10 | 749.16 | 7.33 | 750.18 | 22.07 | 751.20 | 38.75 |
| 748.16 | 0.13 | 749.18 | 7.57 | 750.20 | 22.40 | 751.22 | 39.05 |
| 748.18 | 0.17 | 749.20 | 7.81 | 750.22 | 22.73 | 751.24 | 39.34 |
| 748.20 | 0.22 | 749.22 | 8.05 | 750.24 | 23.05 | 751.26 | 39.63 |
| 748.22 | 0.26 | 749.24 | 8.29 | 750.26 | 23.39 | 751.28 | 39.92 |
| 748.24 | 0.32 | 749.26 | 8.53 | 750.28 | 23.72 | 751.30 | 40.21 |
| 748.26 | 0.37 | 749.28 | 8.78 | 750.30 | 24.05 | 751.32 | 40.50 |
| 748.28 | 0.44 | 749.30 | 9.03 | 750.32 | 24.38 | 751.34 | 40.78 |
| 748.30 | 0.50 | 749.32 | 9.29 | 750.34 | 24.71 | 751.36 | 41.06 |
| 748.32 | 0.58 | 749.34 | 9.54 | 750.36 | 25.05 | 751.38 | 41.33 |
| 748.34 | 0.65 | 749.36 | 9.80 | 750.38 | 25.38 | 751.40 | 41.60 |
| 748.36 | 0.74 | 749.38 | 10.06 | 750.40 | 25.71 | 751.42 | 41.87 |
| 748.38 | 0.82 | 749.40 | 10.33 | 750.42 | 26.05 | 751.44 | 42.13 |
| 748.40 | 0.91 | 749.42 | 10.59 | 750.44 | 26.38 | 751.46 | 42.39 |
| 748.42 | 1.01 | 749.44 | 10.86 | 750.46 | 26.72 | 751.48 | 42.65 |
| 748.44 | 1.11 | 749.46 | 11.13 | 750.48 | 27.05 | 751.50 | 42.90 |
| 748.46 | 1.21 | 749.48 | 11.40 | 750.50 | 27.39 | 751.52 | 43.14 |
| 748.48 | 1.32 | 749.50 | 11.68 | 750.52 | 27.72 | 751.54 | 43.38 |
| 748.50 | 1.44 | 749.52 | 11.95 | 750.54 | 28.06 | 751.56 | 43.62 |
| 748.52 | 1.55 | 749.54 | 12.23 | 750.56 | 28.39 | 751.58 | 43.85 |
| 748.54 | 1.68 | 749.56 | 12.51 | 750.58 | 28.73 | 751.60 | 44.07 |
| 748.56 | 1.80 | 749.58 | 12.80 | 750.60 | 29.06 | 751.62 | 44.29 |
| 748.58 | 1.93 | 749.60 | 13.08 | 750.62 | 29.40 | 751.64 | 44.50 |
| 748.60 | 2.07 | 749.62 | 13.37 | 750.64 | 29.73 | 751.66 | 44.71 |
| 748.62 | 2.21 | 749.64 | 13.66 | 750.66 | 30.07 | 751.68 | 44.91 |
| 748.64 | 2.35 | 749.66 | 13.95 | 750.68 | 30.40 | 751.70 | 45.10 |
| 748.66 | 2.50 | 749.68 | 14.24 | 750.70 | 30.74 | 751.72 | 45.28 |
| 748.68 | 2.65 | 749.70 | 14.54 | 750.72 | 31.07 | 751.74 | 45.45 |
| 748.70 | 2.80 | 749.72 | 14.84 | 750.74 | 31.40 | | |
| 748.72 | 2.96 | 749.74 | 15.13 | 750.76 | 31.73 | | |
| 748.74 | 3.12 | 749.76 | 15.43 | 750.78 | 32.06 | | |
| 748.76 | 3.29 | 749.78 | 15.74 | 750.80 | 32.40 | | |
| 748.78 | 3.46 | 749.80 | 16.04 | 750.82 | 32.73 | | |
| 748.80 | 3.63 | 749.82 | 16.35 | 750.84 | 33.05 | | |
| 748.82 | 3.81 | 749.84 | 16.65 | 750.86 | 33.38 | | |
| 748.84 | 3.99 | 749.86 | 16.96 | 750.88 | 33.71 | | |
| 748.86 | 4.18 | 749.88 | 17.27 | 750.90 | 34.04 | | |
| 748.88 | 4.36 | 749.90 | 17.58 | 750.92 | 34.36 | | |
| 748.90 | 4.56 | 749.92 | 17.89 | 750.94 | 34.68 | | |
| 748.92 | 4.75 | 749.94 | 18.21 | 750.96 | 35.01 | | |
| 748.94 | 4.95 | 749.96 | 18.52 | 750.98 | 35.33 | | |
| 748.96 | 5.15 | 749.98 | 18.84 | 751.00 | 35.65 | | |
| 748.98 | 5.35 | 750.00 | 19.16 | 751.02 | 35.97 | | |
| 749.00 | 5.56 | 750.02 | 19.48 | 751.04 | 36.28 | | |

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Proposed Conditions - II
Type II 24-hr 1-yr Rainfall=1.84"

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Stage-Area-Storage for Pond 1P: Chambers

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---------------------|-------------------------|---------------------|-------------------------|
| 748.00 | 0 | 750.55 | 8,820 |
| 748.05 | 104 | 750.60 | 8,989 |
| 748.10 | 208 | 750.65 | 9,154 |
| 748.15 | 313 | 750.70 | 9,317 |
| 748.20 | 417 | 750.75 | 9,476 |
| 748.25 | 521 | 750.80 | 9,631 |
| 748.30 | 625 | 750.85 | 9,782 |
| 748.35 | 729 | 750.90 | 9,927 |
| 748.40 | 834 | 750.95 | 10,067 |
| 748.45 | 938 | 751.00 | 10,198 |
| 748.50 | 1,042 | 751.05 | 10,322 |
| 748.55 | 1,146 | 751.10 | 10,440 |
| 748.60 | 1,250 | 751.15 | 10,552 |
| 748.65 | 1,355 | 751.20 | 10,662 |
| 748.70 | 1,459 | 751.25 | 10,768 |
| 748.75 | 1,563 | 751.30 | 10,872 |
| 748.80 | 1,783 | 751.35 | 10,976 |
| 748.85 | 2,003 | 751.40 | 11,080 |
| 748.90 | 2,223 | 751.45 | 11,185 |
| 748.95 | 2,441 | 751.50 | 11,289 |
| 749.00 | 2,659 | 751.55 | 11,393 |
| 749.05 | 2,876 | 751.60 | 11,497 |
| 749.10 | 3,092 | 751.65 | 11,601 |
| 749.15 | 3,308 | 751.70 | 11,706 |
| 749.20 | 3,522 | 751.75 | 11,810 |
| 749.25 | 3,736 | | |
| 749.30 | 3,949 | | |
| 749.35 | 4,161 | | |
| 749.40 | 4,371 | | |
| 749.45 | 4,581 | | |
| 749.50 | 4,790 | | |
| 749.55 | 4,997 | | |
| 749.60 | 5,204 | | |
| 749.65 | 5,408 | | |
| 749.70 | 5,612 | | |
| 749.75 | 5,814 | | |
| 749.80 | 6,015 | | |
| 749.85 | 6,215 | | |
| 749.90 | 6,413 | | |
| 749.95 | 6,610 | | |
| 750.00 | 6,805 | | |
| 750.05 | 6,998 | | |
| 750.10 | 7,190 | | |
| 750.15 | 7,380 | | |
| 750.20 | 7,568 | | |
| 750.25 | 7,753 | | |
| 750.30 | 7,937 | | |
| 750.35 | 8,119 | | |
| 750.40 | 8,298 | | |
| 750.45 | 8,475 | | |
| 750.50 | 8,649 | | |

Proposed Conditions II

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Proposed Conditions - II
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Pond B-6: Bioretention B-6

Inflow Area = 2.980 ac, 86.58% Impervious, Inflow Depth = 1.42" for 1-yr event
Inflow = 6.84 cfs @ 11.96 hrs, Volume= 0.353 af
Outflow = 4.16 cfs @ 12.05 hrs, Volume= 0.257 af, Atten= 39%, Lag= 5.4 min
Primary = 4.16 cfs @ 12.05 hrs, Volume= 0.257 af
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 761.79' @ 12.05 hrs Surf.Area= 8,968 sf Storage= 6,734 cf

Plug-Flow detention time= 170.3 min calculated for 0.257 af (73% of inflow)
Center-of-Mass det. time= 77.4 min (865.5 - 788.1)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|--|
| #1 | 761.00' | 18,440 cf | Surf. Storage (Prismatic) Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 761.00 | 8,000 | 0 | 0 |
| 763.00 | 10,440 | 18,440 | 18,440 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|--|
| #1 | Primary | 758.00' | 12.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 758.00' / 757.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf |
| #2 | Device 1 | 761.50' | 24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads |
| #3 | Secondary | 762.00' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=4.13 cfs @ 12.05 hrs HW=761.79' TW=0.00' (Dynamic Tailwater)

↑**1=Culvert** (Passes 4.13 cfs of 6.01 cfs potential flow)

↑**2=Grate** (Weir Controls 4.13 cfs @ 1.77 fps)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=761.00' TW=0.00' (Dynamic Tailwater)

↑**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Proposed Conditions II

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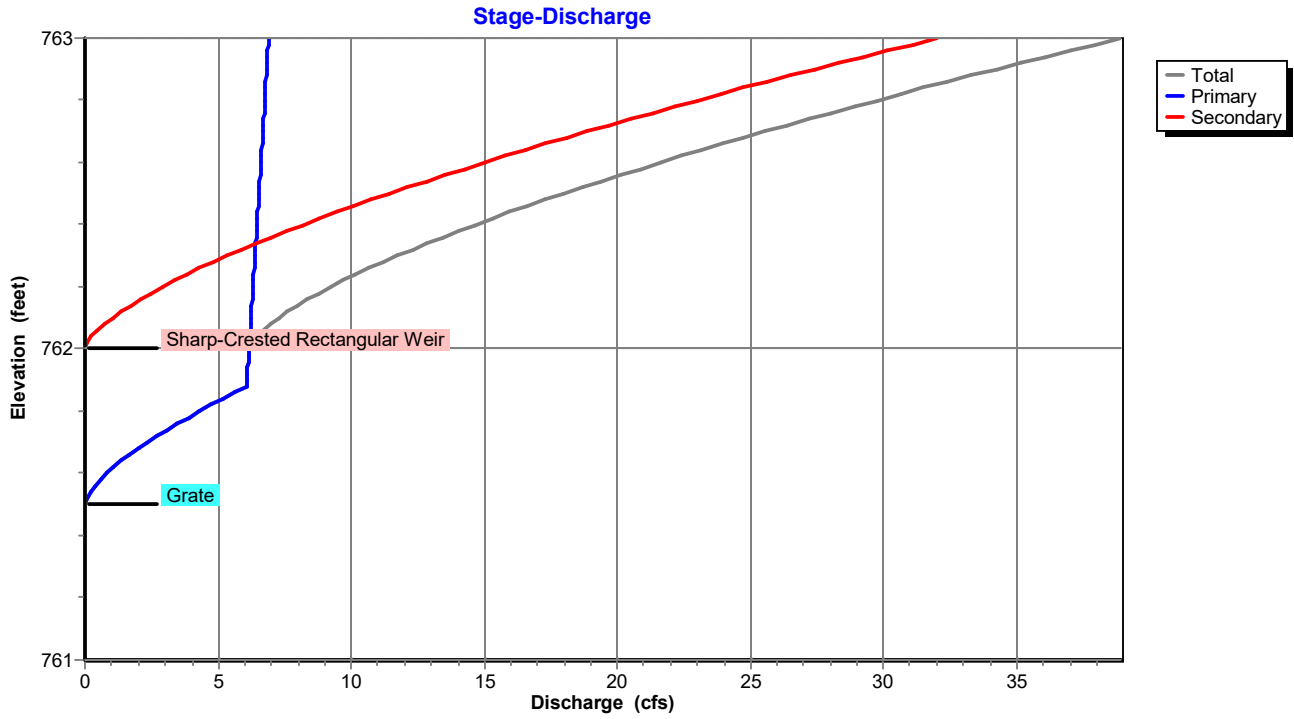
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Type II 24-hr 1-yr Rainfall=1.84"

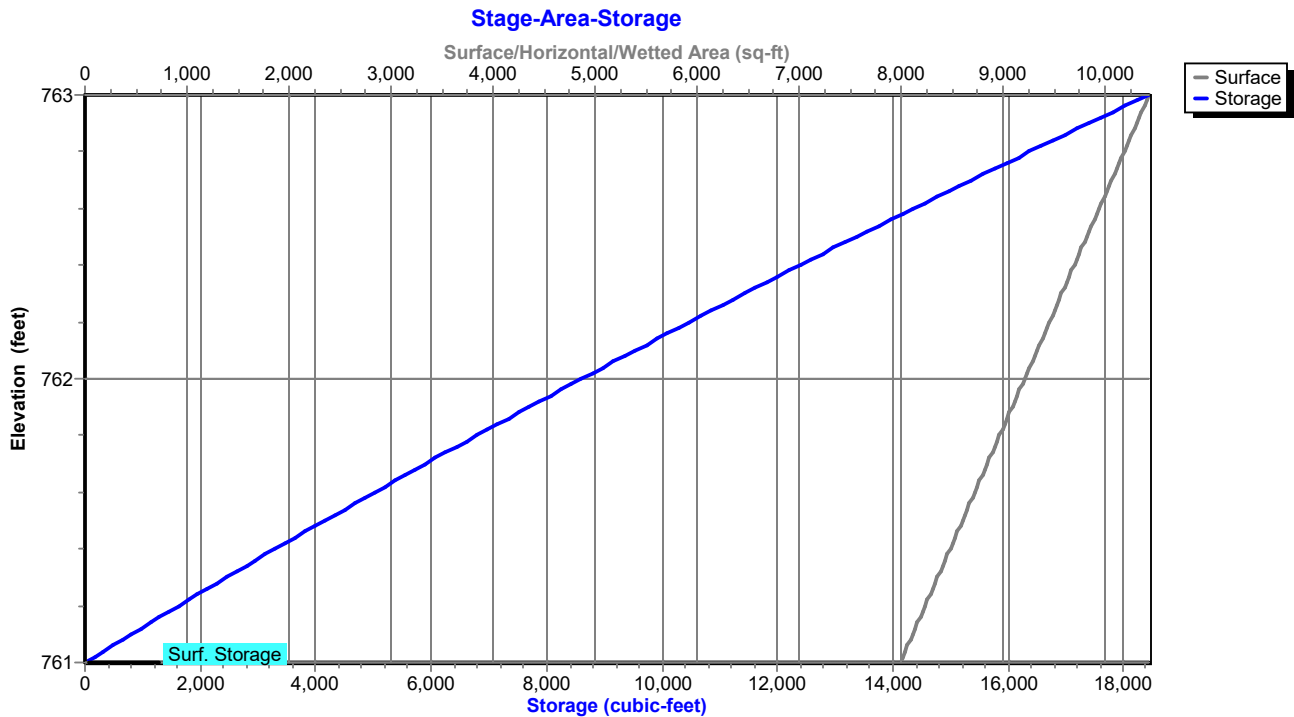
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Pond B-6: Bioretention B-6



Pond B-6: Bioretention B-6



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Proposed Conditions - II
Type II 24-hr 1-yr Rainfall=1.84"

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Stage-Discharge for Pond B-6: Bioretention B-6

| Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) | Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) |
|---------------------|--------------------|------------------|--------------------|---------------------|--------------------|------------------|--------------------|
| 761.00 | 0.00 | 0.00 | 0.00 | 762.02 | 6.28 | 6.18 | 0.09 |
| 761.02 | 0.00 | 0.00 | 0.00 | 762.04 | 6.46 | 6.20 | 0.26 |
| 761.04 | 0.00 | 0.00 | 0.00 | 762.06 | 6.70 | 6.22 | 0.48 |
| 761.06 | 0.00 | 0.00 | 0.00 | 762.08 | 6.97 | 6.23 | 0.74 |
| 761.08 | 0.00 | 0.00 | 0.00 | 762.10 | 7.28 | 6.25 | 1.03 |
| 761.10 | 0.00 | 0.00 | 0.00 | 762.12 | 7.62 | 6.26 | 1.36 |
| 761.12 | 0.00 | 0.00 | 0.00 | 762.14 | 7.98 | 6.28 | 1.71 |
| 761.14 | 0.00 | 0.00 | 0.00 | 762.16 | 8.38 | 6.29 | 2.09 |
| 761.16 | 0.00 | 0.00 | 0.00 | 762.18 | 8.79 | 6.31 | 2.49 |
| 761.18 | 0.00 | 0.00 | 0.00 | 762.20 | 9.23 | 6.32 | 2.91 |
| 761.20 | 0.00 | 0.00 | 0.00 | 762.22 | 9.70 | 6.34 | 3.36 |
| 761.22 | 0.00 | 0.00 | 0.00 | 762.24 | 10.18 | 6.35 | 3.83 |
| 761.24 | 0.00 | 0.00 | 0.00 | 762.26 | 10.68 | 6.37 | 4.31 |
| 761.26 | 0.00 | 0.00 | 0.00 | 762.28 | 11.20 | 6.38 | 4.82 |
| 761.28 | 0.00 | 0.00 | 0.00 | 762.30 | 11.74 | 6.40 | 5.34 |
| 761.30 | 0.00 | 0.00 | 0.00 | 762.32 | 12.29 | 6.41 | 5.88 |
| 761.32 | 0.00 | 0.00 | 0.00 | 762.34 | 12.86 | 6.43 | 6.44 |
| 761.34 | 0.00 | 0.00 | 0.00 | 762.36 | 13.45 | 6.44 | 7.01 |
| 761.36 | 0.00 | 0.00 | 0.00 | 762.38 | 14.06 | 6.46 | 7.60 |
| 761.38 | 0.00 | 0.00 | 0.00 | 762.40 | 14.68 | 6.47 | 8.21 |
| 761.40 | 0.00 | 0.00 | 0.00 | 762.42 | 15.31 | 6.48 | 8.83 |
| 761.42 | 0.00 | 0.00 | 0.00 | 762.44 | 15.96 | 6.50 | 9.46 |
| 761.44 | 0.00 | 0.00 | 0.00 | 762.46 | 16.62 | 6.51 | 10.11 |
| 761.46 | 0.00 | 0.00 | 0.00 | 762.48 | 17.30 | 6.53 | 10.77 |
| 761.48 | 0.00 | 0.00 | 0.00 | 762.50 | 17.99 | 6.54 | 11.45 |
| 761.50 | 0.00 | 0.00 | 0.00 | 762.52 | 18.69 | 6.56 | 12.13 |
| 761.52 | 0.07 | 0.07 | 0.00 | 762.54 | 19.41 | 6.57 | 12.84 |
| 761.54 | 0.21 | 0.21 | 0.00 | 762.56 | 20.14 | 6.59 | 13.55 |
| 761.56 | 0.38 | 0.38 | 0.00 | 762.58 | 20.88 | 6.60 | 14.28 |
| 761.58 | 0.59 | 0.59 | 0.00 | 762.60 | 21.63 | 6.62 | 15.02 |
| 761.60 | 0.83 | 0.83 | 0.00 | 762.62 | 22.40 | 6.63 | 15.77 |
| 761.62 | 1.09 | 1.09 | 0.00 | 762.64 | 23.17 | 6.64 | 16.53 |
| 761.64 | 1.37 | 1.37 | 0.00 | 762.66 | 23.96 | 6.66 | 17.30 |
| 761.66 | 1.67 | 1.67 | 0.00 | 762.68 | 24.76 | 6.67 | 18.09 |
| 761.68 | 2.00 | 2.00 | 0.00 | 762.70 | 25.57 | 6.69 | 18.88 |
| 761.70 | 2.34 | 2.34 | 0.00 | 762.72 | 26.39 | 6.70 | 19.69 |
| 761.72 | 2.70 | 2.70 | 0.00 | 762.74 | 27.22 | 6.72 | 20.51 |
| 761.74 | 3.08 | 3.08 | 0.00 | 762.76 | 28.07 | 6.73 | 21.34 |
| 761.76 | 3.47 | 3.47 | 0.00 | 762.78 | 28.92 | 6.74 | 22.17 |
| 761.78 | 3.88 | 3.88 | 0.00 | 762.80 | 29.78 | 6.76 | 23.02 |
| 761.80 | 4.30 | 4.30 | 0.00 | 762.82 | 30.65 | 6.77 | 23.88 |
| 761.82 | 4.74 | 4.74 | 0.00 | 762.84 | 31.54 | 6.79 | 24.75 |
| 761.84 | 5.19 | 5.19 | 0.00 | 762.86 | 32.43 | 6.80 | 25.63 |
| 761.86 | 5.65 | 5.65 | 0.00 | 762.88 | 33.33 | 6.81 | 26.52 |
| 761.88 | 6.08 | 6.08 | 0.00 | 762.90 | 34.25 | 6.83 | 27.42 |
| 761.90 | 6.09 | 6.09 | 0.00 | 762.92 | 35.17 | 6.84 | 28.32 |
| 761.92 | 6.11 | 6.11 | 0.00 | 762.94 | 36.10 | 6.86 | 29.24 |
| 761.94 | 6.12 | 6.12 | 0.00 | 762.96 | 37.04 | 6.87 | 30.17 |
| 761.96 | 6.14 | 6.14 | 0.00 | 762.98 | 37.99 | 6.88 | 31.10 |
| 761.98 | 6.15 | 6.15 | 0.00 | 763.00 | 38.94 | 6.90 | 32.05 |
| 762.00 | 6.17 | 6.17 | 0.00 | | | | |

Proposed Conditions II

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Proposed Conditions - II
Type II 24-hr 1-yr Rainfall=1.84"

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Stage-Area-Storage for Pond B-6: Bioretention B-6

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 761.00 | 8,000 | 0 | 762.02 | 9,244 | 8,795 |
| 761.02 | 8,024 | 160 | 762.04 | 9,269 | 8,980 |
| 761.04 | 8,049 | 321 | 762.06 | 9,293 | 9,165 |
| 761.06 | 8,073 | 482 | 762.08 | 9,318 | 9,352 |
| 761.08 | 8,098 | 644 | 762.10 | 9,342 | 9,538 |
| 761.10 | 8,122 | 806 | 762.12 | 9,366 | 9,725 |
| 761.12 | 8,146 | 969 | 762.14 | 9,391 | 9,913 |
| 761.14 | 8,171 | 1,132 | 762.16 | 9,415 | 10,101 |
| 761.16 | 8,195 | 1,296 | 762.18 | 9,440 | 10,289 |
| 761.18 | 8,220 | 1,460 | 762.20 | 9,464 | 10,478 |
| 761.20 | 8,244 | 1,624 | 762.22 | 9,488 | 10,668 |
| 761.22 | 8,268 | 1,790 | 762.24 | 9,513 | 10,858 |
| 761.24 | 8,293 | 1,955 | 762.26 | 9,537 | 11,048 |
| 761.26 | 8,317 | 2,121 | 762.28 | 9,562 | 11,239 |
| 761.28 | 8,342 | 2,288 | 762.30 | 9,586 | 11,431 |
| 761.30 | 8,366 | 2,455 | 762.32 | 9,610 | 11,623 |
| 761.32 | 8,390 | 2,622 | 762.34 | 9,635 | 11,815 |
| 761.34 | 8,415 | 2,791 | 762.36 | 9,659 | 12,008 |
| 761.36 | 8,439 | 2,959 | 762.38 | 9,684 | 12,202 |
| 761.38 | 8,464 | 3,128 | 762.40 | 9,708 | 12,396 |
| 761.40 | 8,488 | 3,298 | 762.42 | 9,732 | 12,590 |
| 761.42 | 8,512 | 3,468 | 762.44 | 9,757 | 12,785 |
| 761.44 | 8,537 | 3,638 | 762.46 | 9,781 | 12,980 |
| 761.46 | 8,561 | 3,809 | 762.48 | 9,806 | 13,176 |
| 761.48 | 8,586 | 3,981 | 762.50 | 9,830 | 13,373 |
| 761.50 | 8,610 | 4,153 | 762.52 | 9,854 | 13,569 |
| 761.52 | 8,634 | 4,325 | 762.54 | 9,879 | 13,767 |
| 761.54 | 8,659 | 4,498 | 762.56 | 9,903 | 13,964 |
| 761.56 | 8,683 | 4,671 | 762.58 | 9,928 | 14,163 |
| 761.58 | 8,708 | 4,845 | 762.60 | 9,952 | 14,362 |
| 761.60 | 8,732 | 5,020 | 762.62 | 9,976 | 14,561 |
| 761.62 | 8,756 | 5,194 | 762.64 | 10,001 | 14,761 |
| 761.64 | 8,781 | 5,370 | 762.66 | 10,025 | 14,961 |
| 761.66 | 8,805 | 5,546 | 762.68 | 10,050 | 15,162 |
| 761.68 | 8,830 | 5,722 | 762.70 | 10,074 | 15,363 |
| 761.70 | 8,854 | 5,899 | 762.72 | 10,098 | 15,565 |
| 761.72 | 8,878 | 6,076 | 762.74 | 10,123 | 15,767 |
| 761.74 | 8,903 | 6,254 | 762.76 | 10,147 | 15,970 |
| 761.76 | 8,927 | 6,432 | 762.78 | 10,172 | 16,173 |
| 761.78 | 8,952 | 6,611 | 762.80 | 10,196 | 16,376 |
| 761.80 | 8,976 | 6,790 | 762.82 | 10,220 | 16,581 |
| 761.82 | 9,000 | 6,970 | 762.84 | 10,245 | 16,785 |
| 761.84 | 9,025 | 7,150 | 762.86 | 10,269 | 16,990 |
| 761.86 | 9,049 | 7,331 | 762.88 | 10,294 | 17,196 |
| 761.88 | 9,074 | 7,512 | 762.90 | 10,318 | 17,402 |
| 761.90 | 9,098 | 7,694 | 762.92 | 10,342 | 17,609 |
| 761.92 | 9,122 | 7,876 | 762.94 | 10,367 | 17,816 |
| 761.94 | 9,147 | 8,059 | 762.96 | 10,391 | 18,023 |
| 761.96 | 9,171 | 8,242 | 762.98 | 10,416 | 18,231 |
| 761.98 | 9,196 | 8,426 | 763.00 | 10,440 | 18,440 |
| 762.00 | 9,220 | 8,610 | | | |

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Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link 2AR: 2A Reach

Inflow Area = 43.007 ac, 86.82% Impervious, Inflow Depth = 1.39" for 1-yr event
Inflow = 64.21 cfs @ 12.12 hrs, Volume= 4.993 af
Primary = 63.38 cfs @ 12.23 hrs, Volume= 4.993 af, Atten= 1%, Lag= 7.0 min

Primary outflow = Inflow delayed by 6.9 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link 2AT: DA 2A Total

Inflow Area = 43.007 ac, 86.82% Impervious, Inflow Depth = 1.39" for 1-yr event
Inflow = 64.21 cfs @ 12.12 hrs, Volume= 4.993 af
Primary = 64.21 cfs @ 12.12 hrs, Volume= 4.993 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - II
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link 2BP: Bypass

Inflow Area = 17.418 ac, 99.32% Impervious, Inflow Depth = 1.62" for 1-yr event
Inflow = 43.13 cfs @ 11.96 hrs, Volume= 2.345 af
Primary = 43.13 cfs @ 11.96 hrs, Volume= 2.345 af, Atten= 0%, Lag= 0.0 min
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Primary outflow = Inflow below 70.00 cfs, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link 2BR: 2BR

Inflow Area = 11.872 ac, 100.00% Impervious, Inflow Depth = 1.62" for 1-yr event
Inflow = 29.40 cfs @ 11.96 hrs, Volume= 1.599 af
Primary = 28.54 cfs @ 12.10 hrs, Volume= 1.599 af, Atten= 3%, Lag= 8.0 min

Primary outflow = Inflow delayed by 8.0 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - II
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link 2DT: DA 2D Total

Inflow Area = 17.418 ac, 99.32% Impervious, Inflow Depth = 1.62" for 1-yr event
Inflow = 43.13 cfs @ 11.96 hrs, Volume= 2.345 af
Primary = 43.13 cfs @ 11.96 hrs, Volume= 2.345 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - II
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link DP-2: DP #2 - Smokes Crk

Inflow Area = 83.814 ac, 88.53% Impervious, Inflow Depth = 1.42" for 1-yr event
Inflow = 101.88 cfs @ 12.00 hrs, Volume= 9.921 af
Primary = 101.88 cfs @ 12.00 hrs, Volume= 9.921 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - II

Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Subcatchment 2A-I: DA #2A-I

Runoff = 111.62 cfs @ 12.12 hrs, Volume= 9.006 af, Depth= 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.883 | 74 | >75% Grass cover, Good, HSG C |
| 3.754 | 80 | >75% Grass cover, Good, HSG D |
| 5.748 | 98 | Paved parking, HSG C |
| 29.010 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.632 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 40.027 | 96 | Weighted Average |
| 5.269 | | 13.16% Pervious Area |
| 34.758 | | 86.84% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 1.9 | 98 | 0.0100 | 0.86 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 13.7 | 65 | 0.0150 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 0.8 | 80 | 0.0100 | 1.61 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 2.1 | 320 | 0.0150 | 2.49 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 1.7 | 446 | | 4.50 | | Direct Entry, Pipe Flow |
| 20.2 | 1,009 | Total | | | |

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Proposed Conditions - II

Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Subcatchment 2A-II: DA #2A-II

Runoff = 12.48 cfs @ 11.96 hrs, Volume= 0.670 af, Depth= 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.400 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 2.580 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 2.980 | 96 | Weighted Average |
| 0.400 | | 13.42% Pervious Area |
| 2.580 | | 86.58% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.6 | 100 | 0.0150 | 1.02 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 3.0 | 450 | 0.0150 | 2.49 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 4.6 | 550 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - II

Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Subcatchment 2B: DA #2B

Runoff = 51.38 cfs @ 11.96 hrs, Volume= 2.887 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.000 | 80 | >75% Grass cover, Good, HSG D |
| 2.682 | 98 | Paved parking, HSG C |
| 9.190 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 11.872 | 98 | Weighted Average |
| 11.872 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.9 | 100 | 0.0100 | 0.86 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 1.6 | 200 | 0.0100 | 2.03 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 3.5 | 300 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - II

Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Subcatchment 2C: DA #2C

Runoff = 42.21 cfs @ 11.97 hrs, Volume= 2.122 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.913 | 74 | >75% Grass cover, Good, HSG C |
| 2.316 | 80 | >75% Grass cover, Good, HSG D |
| 1.729 | 98 | Paved parking, HSG C |
| 5.964 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.595 | 77 | Woods, Good, HSG D |
| 11.517 | 91 | Weighted Average |
| 3.824 | | 33.20% Pervious Area |
| 7.693 | | 66.80% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.9 | 100 | 0.0100 | 0.86 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 1.6 | 200 | 0.0100 | 2.03 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 3.5 | 300 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - II

Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Subcatchment 2D: DA #2D

Runoff = 75.39 cfs @ 11.96 hrs, Volume= 4.235 af, Depth= 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.118 | 80 | >75% Grass cover, Good, HSG D |
| 10.554 | 98 | Paved parking, HSG C |
| 6.746 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 17.418 | 98 | Weighted Average |
| 0.118 | | 0.68% Pervious Area |
| 17.300 | | 99.32% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.9 | 98 | 0.0100 | 0.86 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 1.7 | 446 | | 4.50 | | Direct Entry, Pipe Flow |
| 3.6 | 544 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - II
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Pond 1P: Chambers

Inflow = 4.83 cfs @ 11.95 hrs, Volume= 0.020 af
Outflow = 0.78 cfs @ 12.01 hrs, Volume= 0.020 af, Atten= 84%, Lag= 3.6 min
Primary = 0.78 cfs @ 12.01 hrs, Volume= 0.020 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 748.37' @ 12.01 hrs Surf.Area= 5,210 sf Storage= 777 cf

Plug-Flow detention time= 78.1 min calculated for 0.020 af (99% of inflow)
Center-of-Mass det. time= 80.5 min (797.5 - 717.0)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|---|
| #1A | 748.00' | 5,151 cf | 58.50'W x 89.06'L x 3.75'H Field A 19,537 cf Overall - 6,658 cf Embedded = 12,878 cf x 40.0% Voids |
| #2A | 748.75' | 6,658 cf | ADS_StormTech DC-780 +Cap x 144 Inside #1 Effective Size= 45.4"W x 30.0"H => 6.49 sf x 7.12'L = 46.2 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 144 Chambers in 12 Rows |
| | | 11,810 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

| Device | Routing | Invert | Outlet Devices |
|--------|---------|---------|--|
| #1 | Primary | 748.00' | 36.0" Round Culvert L= 165.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 748.00' / 747.35' S= 0.0039 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf |

Primary OutFlow Max=0.71 cfs @ 12.01 hrs HW=748.35' TW=0.00' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 0.71 cfs @ 2.31 fps)

Proposed Conditions II

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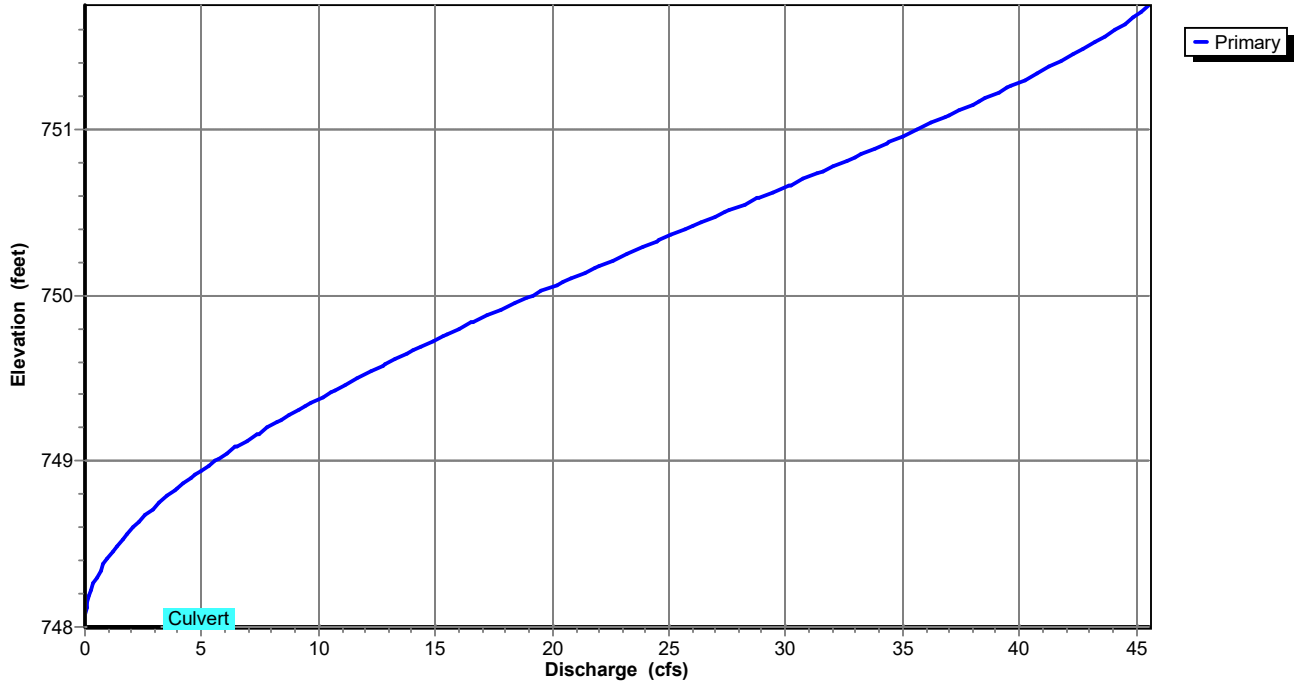
Proposed Conditions - II
Type II 24-hr 10-yr Rainfall=3.15"

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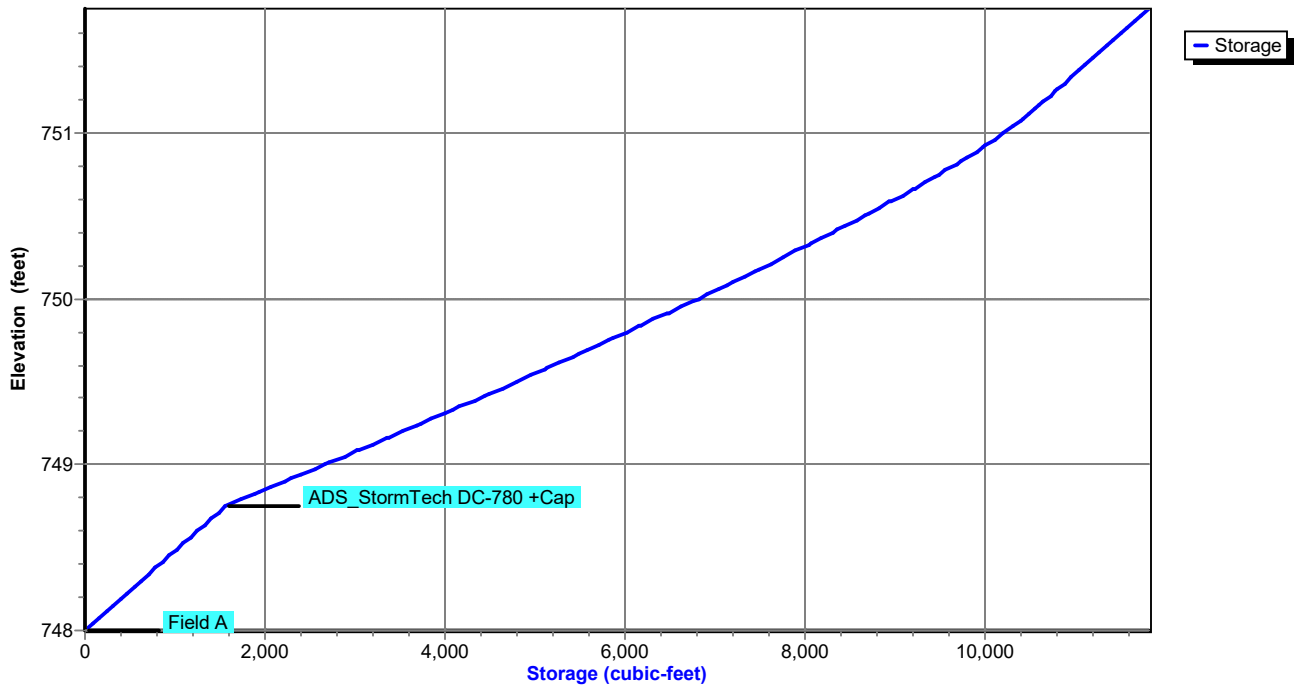
Pond 1P: Chambers

Stage-Discharge



Pond 1P: Chambers

Stage-Area-Storage



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Type II 24-hr 10-yr Rainfall=3.15"

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Stage-Discharge for Pond 1P: Chambers

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|
| 748.00 | 0.00 | 749.02 | 5.77 | 750.04 | 19.80 | 751.06 | 36.60 |
| 748.02 | 0.00 | 749.04 | 5.99 | 750.06 | 20.12 | 751.08 | 36.91 |
| 748.04 | 0.01 | 749.06 | 6.20 | 750.08 | 20.44 | 751.10 | 37.22 |
| 748.06 | 0.02 | 749.08 | 6.42 | 750.10 | 20.76 | 751.12 | 37.53 |
| 748.08 | 0.03 | 749.10 | 6.65 | 750.12 | 21.09 | 751.14 | 37.84 |
| 748.10 | 0.05 | 749.12 | 6.87 | 750.14 | 21.41 | 751.16 | 38.14 |
| 748.12 | 0.07 | 749.14 | 7.10 | 750.16 | 21.74 | 751.18 | 38.45 |
| 748.14 | 0.10 | 749.16 | 7.33 | 750.18 | 22.07 | 751.20 | 38.75 |
| 748.16 | 0.13 | 749.18 | 7.57 | 750.20 | 22.40 | 751.22 | 39.05 |
| 748.18 | 0.17 | 749.20 | 7.81 | 750.22 | 22.73 | 751.24 | 39.34 |
| 748.20 | 0.22 | 749.22 | 8.05 | 750.24 | 23.05 | 751.26 | 39.63 |
| 748.22 | 0.26 | 749.24 | 8.29 | 750.26 | 23.39 | 751.28 | 39.92 |
| 748.24 | 0.32 | 749.26 | 8.53 | 750.28 | 23.72 | 751.30 | 40.21 |
| 748.26 | 0.37 | 749.28 | 8.78 | 750.30 | 24.05 | 751.32 | 40.50 |
| 748.28 | 0.44 | 749.30 | 9.03 | 750.32 | 24.38 | 751.34 | 40.78 |
| 748.30 | 0.50 | 749.32 | 9.29 | 750.34 | 24.71 | 751.36 | 41.06 |
| 748.32 | 0.58 | 749.34 | 9.54 | 750.36 | 25.05 | 751.38 | 41.33 |
| 748.34 | 0.65 | 749.36 | 9.80 | 750.38 | 25.38 | 751.40 | 41.60 |
| 748.36 | 0.74 | 749.38 | 10.06 | 750.40 | 25.71 | 751.42 | 41.87 |
| 748.38 | 0.82 | 749.40 | 10.33 | 750.42 | 26.05 | 751.44 | 42.13 |
| 748.40 | 0.91 | 749.42 | 10.59 | 750.44 | 26.38 | 751.46 | 42.39 |
| 748.42 | 1.01 | 749.44 | 10.86 | 750.46 | 26.72 | 751.48 | 42.65 |
| 748.44 | 1.11 | 749.46 | 11.13 | 750.48 | 27.05 | 751.50 | 42.90 |
| 748.46 | 1.21 | 749.48 | 11.40 | 750.50 | 27.39 | 751.52 | 43.14 |
| 748.48 | 1.32 | 749.50 | 11.68 | 750.52 | 27.72 | 751.54 | 43.38 |
| 748.50 | 1.44 | 749.52 | 11.95 | 750.54 | 28.06 | 751.56 | 43.62 |
| 748.52 | 1.55 | 749.54 | 12.23 | 750.56 | 28.39 | 751.58 | 43.85 |
| 748.54 | 1.68 | 749.56 | 12.51 | 750.58 | 28.73 | 751.60 | 44.07 |
| 748.56 | 1.80 | 749.58 | 12.80 | 750.60 | 29.06 | 751.62 | 44.29 |
| 748.58 | 1.93 | 749.60 | 13.08 | 750.62 | 29.40 | 751.64 | 44.50 |
| 748.60 | 2.07 | 749.62 | 13.37 | 750.64 | 29.73 | 751.66 | 44.71 |
| 748.62 | 2.21 | 749.64 | 13.66 | 750.66 | 30.07 | 751.68 | 44.91 |
| 748.64 | 2.35 | 749.66 | 13.95 | 750.68 | 30.40 | 751.70 | 45.10 |
| 748.66 | 2.50 | 749.68 | 14.24 | 750.70 | 30.74 | 751.72 | 45.28 |
| 748.68 | 2.65 | 749.70 | 14.54 | 750.72 | 31.07 | 751.74 | 45.45 |
| 748.70 | 2.80 | 749.72 | 14.84 | 750.74 | 31.40 | | |
| 748.72 | 2.96 | 749.74 | 15.13 | 750.76 | 31.73 | | |
| 748.74 | 3.12 | 749.76 | 15.43 | 750.78 | 32.06 | | |
| 748.76 | 3.29 | 749.78 | 15.74 | 750.80 | 32.40 | | |
| 748.78 | 3.46 | 749.80 | 16.04 | 750.82 | 32.73 | | |
| 748.80 | 3.63 | 749.82 | 16.35 | 750.84 | 33.05 | | |
| 748.82 | 3.81 | 749.84 | 16.65 | 750.86 | 33.38 | | |
| 748.84 | 3.99 | 749.86 | 16.96 | 750.88 | 33.71 | | |
| 748.86 | 4.18 | 749.88 | 17.27 | 750.90 | 34.04 | | |
| 748.88 | 4.36 | 749.90 | 17.58 | 750.92 | 34.36 | | |
| 748.90 | 4.56 | 749.92 | 17.89 | 750.94 | 34.68 | | |
| 748.92 | 4.75 | 749.94 | 18.21 | 750.96 | 35.01 | | |
| 748.94 | 4.95 | 749.96 | 18.52 | 750.98 | 35.33 | | |
| 748.96 | 5.15 | 749.98 | 18.84 | 751.00 | 35.65 | | |
| 748.98 | 5.35 | 750.00 | 19.16 | 751.02 | 35.97 | | |
| 749.00 | 5.56 | 750.02 | 19.48 | 751.04 | 36.28 | | |

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Stage-Area-Storage for Pond 1P: Chambers

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---------------------|-------------------------|---------------------|-------------------------|
| 748.00 | 0 | 750.55 | 8,820 |
| 748.05 | 104 | 750.60 | 8,989 |
| 748.10 | 208 | 750.65 | 9,154 |
| 748.15 | 313 | 750.70 | 9,317 |
| 748.20 | 417 | 750.75 | 9,476 |
| 748.25 | 521 | 750.80 | 9,631 |
| 748.30 | 625 | 750.85 | 9,782 |
| 748.35 | 729 | 750.90 | 9,927 |
| 748.40 | 834 | 750.95 | 10,067 |
| 748.45 | 938 | 751.00 | 10,198 |
| 748.50 | 1,042 | 751.05 | 10,322 |
| 748.55 | 1,146 | 751.10 | 10,440 |
| 748.60 | 1,250 | 751.15 | 10,552 |
| 748.65 | 1,355 | 751.20 | 10,662 |
| 748.70 | 1,459 | 751.25 | 10,768 |
| 748.75 | 1,563 | 751.30 | 10,872 |
| 748.80 | 1,783 | 751.35 | 10,976 |
| 748.85 | 2,003 | 751.40 | 11,080 |
| 748.90 | 2,223 | 751.45 | 11,185 |
| 748.95 | 2,441 | 751.50 | 11,289 |
| 749.00 | 2,659 | 751.55 | 11,393 |
| 749.05 | 2,876 | 751.60 | 11,497 |
| 749.10 | 3,092 | 751.65 | 11,601 |
| 749.15 | 3,308 | 751.70 | 11,706 |
| 749.20 | 3,522 | 751.75 | 11,810 |
| 749.25 | 3,736 | | |
| 749.30 | 3,949 | | |
| 749.35 | 4,161 | | |
| 749.40 | 4,371 | | |
| 749.45 | 4,581 | | |
| 749.50 | 4,790 | | |
| 749.55 | 4,997 | | |
| 749.60 | 5,204 | | |
| 749.65 | 5,408 | | |
| 749.70 | 5,612 | | |
| 749.75 | 5,814 | | |
| 749.80 | 6,015 | | |
| 749.85 | 6,215 | | |
| 749.90 | 6,413 | | |
| 749.95 | 6,610 | | |
| 750.00 | 6,805 | | |
| 750.05 | 6,998 | | |
| 750.10 | 7,190 | | |
| 750.15 | 7,380 | | |
| 750.20 | 7,568 | | |
| 750.25 | 7,753 | | |
| 750.30 | 7,937 | | |
| 750.35 | 8,119 | | |
| 750.40 | 8,298 | | |
| 750.45 | 8,475 | | |
| 750.50 | 8,649 | | |

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Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Pond B-6: Bioretention B-6

Inflow Area = 2.980 ac, 86.58% Impervious, Inflow Depth = 2.70" for 10-yr event
Inflow = 12.48 cfs @ 11.96 hrs, Volume= 0.670 af
Outflow = 7.53 cfs @ 12.05 hrs, Volume= 0.575 af, Atten= 40%, Lag= 5.3 min
Primary = 6.26 cfs @ 12.05 hrs, Volume= 0.564 af
Secondary = 1.27 cfs @ 12.05 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 762.11' @ 12.05 hrs Surf.Area= 9,360 sf Storage= 9,677 cf

Plug-Flow detention time= 125.3 min calculated for 0.575 af (86% of inflow)
Center-of-Mass det. time= 58.9 min (829.9 - 771.0)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|--|
| #1 | 761.00' | 18,440 cf | Surf. Storage (Prismatic) Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|------------------|-------------------|------------------------|------------------------|
| 761.00 | 8,000 | 0 | 0 |
| 763.00 | 10,440 | 18,440 | 18,440 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|--|
| #1 | Primary | 758.00' | 12.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 758.00' / 757.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf |
| #2 | Device 1 | 761.50' | 24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads |
| #3 | Secondary | 762.00' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=6.26 cfs @ 12.05 hrs HW=762.11' TW=0.00' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 6.26 cfs @ 7.97 fps)

↑**2=Grate** (Passes 6.26 cfs of 12.56 cfs potential flow)

Secondary OutFlow Max=1.25 cfs @ 12.05 hrs HW=762.11' TW=0.00' (Dynamic Tailwater)

↑**3=Sharp-Crested Rectangular Weir** (Weir Controls 1.25 cfs @ 1.10 fps)

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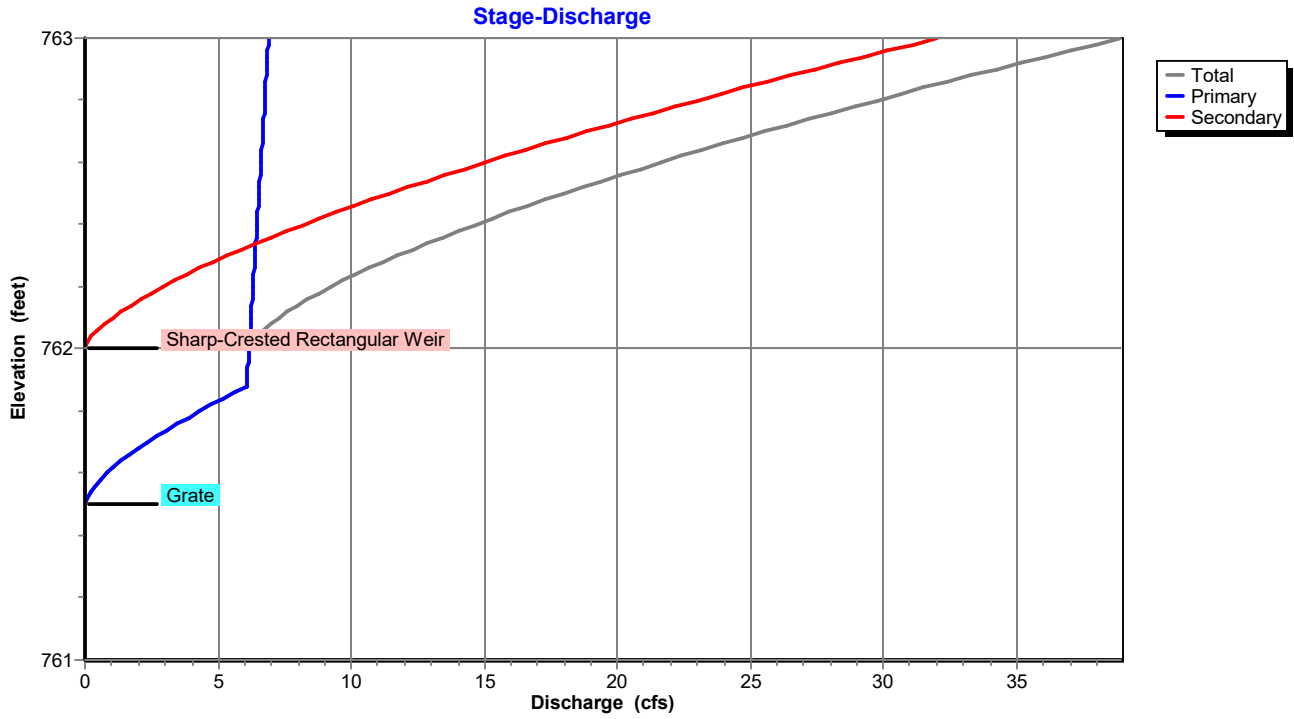
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Proposed Conditions - II
Type II 24-hr 10-yr Rainfall=3.15"

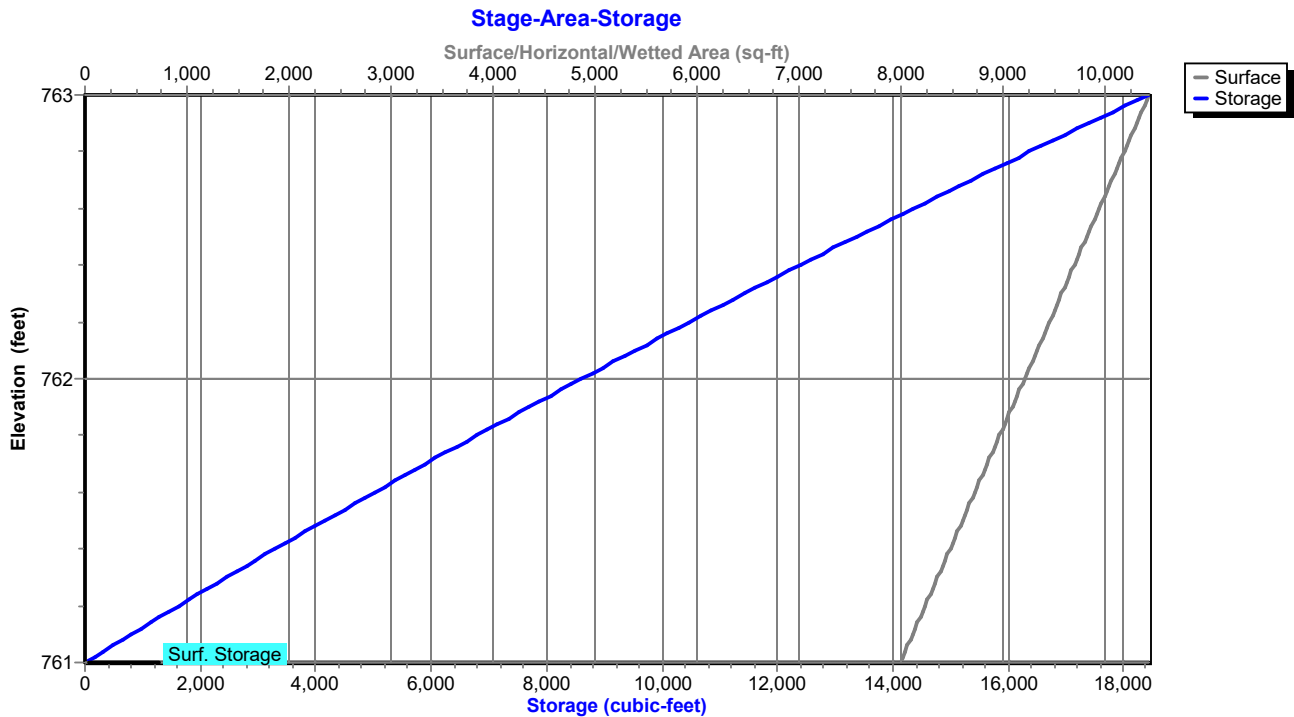
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Pond B-6: Bioretention B-6



Pond B-6: Bioretention B-6



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Stage-Discharge for Pond B-6: Bioretention B-6

| Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) | Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) |
|---------------------|--------------------|------------------|--------------------|---------------------|--------------------|------------------|--------------------|
| 761.00 | 0.00 | 0.00 | 0.00 | 762.02 | 6.28 | 6.18 | 0.09 |
| 761.02 | 0.00 | 0.00 | 0.00 | 762.04 | 6.46 | 6.20 | 0.26 |
| 761.04 | 0.00 | 0.00 | 0.00 | 762.06 | 6.70 | 6.22 | 0.48 |
| 761.06 | 0.00 | 0.00 | 0.00 | 762.08 | 6.97 | 6.23 | 0.74 |
| 761.08 | 0.00 | 0.00 | 0.00 | 762.10 | 7.28 | 6.25 | 1.03 |
| 761.10 | 0.00 | 0.00 | 0.00 | 762.12 | 7.62 | 6.26 | 1.36 |
| 761.12 | 0.00 | 0.00 | 0.00 | 762.14 | 7.98 | 6.28 | 1.71 |
| 761.14 | 0.00 | 0.00 | 0.00 | 762.16 | 8.38 | 6.29 | 2.09 |
| 761.16 | 0.00 | 0.00 | 0.00 | 762.18 | 8.79 | 6.31 | 2.49 |
| 761.18 | 0.00 | 0.00 | 0.00 | 762.20 | 9.23 | 6.32 | 2.91 |
| 761.20 | 0.00 | 0.00 | 0.00 | 762.22 | 9.70 | 6.34 | 3.36 |
| 761.22 | 0.00 | 0.00 | 0.00 | 762.24 | 10.18 | 6.35 | 3.83 |
| 761.24 | 0.00 | 0.00 | 0.00 | 762.26 | 10.68 | 6.37 | 4.31 |
| 761.26 | 0.00 | 0.00 | 0.00 | 762.28 | 11.20 | 6.38 | 4.82 |
| 761.28 | 0.00 | 0.00 | 0.00 | 762.30 | 11.74 | 6.40 | 5.34 |
| 761.30 | 0.00 | 0.00 | 0.00 | 762.32 | 12.29 | 6.41 | 5.88 |
| 761.32 | 0.00 | 0.00 | 0.00 | 762.34 | 12.86 | 6.43 | 6.44 |
| 761.34 | 0.00 | 0.00 | 0.00 | 762.36 | 13.45 | 6.44 | 7.01 |
| 761.36 | 0.00 | 0.00 | 0.00 | 762.38 | 14.06 | 6.46 | 7.60 |
| 761.38 | 0.00 | 0.00 | 0.00 | 762.40 | 14.68 | 6.47 | 8.21 |
| 761.40 | 0.00 | 0.00 | 0.00 | 762.42 | 15.31 | 6.48 | 8.83 |
| 761.42 | 0.00 | 0.00 | 0.00 | 762.44 | 15.96 | 6.50 | 9.46 |
| 761.44 | 0.00 | 0.00 | 0.00 | 762.46 | 16.62 | 6.51 | 10.11 |
| 761.46 | 0.00 | 0.00 | 0.00 | 762.48 | 17.30 | 6.53 | 10.77 |
| 761.48 | 0.00 | 0.00 | 0.00 | 762.50 | 17.99 | 6.54 | 11.45 |
| 761.50 | 0.00 | 0.00 | 0.00 | 762.52 | 18.69 | 6.56 | 12.13 |
| 761.52 | 0.07 | 0.07 | 0.00 | 762.54 | 19.41 | 6.57 | 12.84 |
| 761.54 | 0.21 | 0.21 | 0.00 | 762.56 | 20.14 | 6.59 | 13.55 |
| 761.56 | 0.38 | 0.38 | 0.00 | 762.58 | 20.88 | 6.60 | 14.28 |
| 761.58 | 0.59 | 0.59 | 0.00 | 762.60 | 21.63 | 6.62 | 15.02 |
| 761.60 | 0.83 | 0.83 | 0.00 | 762.62 | 22.40 | 6.63 | 15.77 |
| 761.62 | 1.09 | 1.09 | 0.00 | 762.64 | 23.17 | 6.64 | 16.53 |
| 761.64 | 1.37 | 1.37 | 0.00 | 762.66 | 23.96 | 6.66 | 17.30 |
| 761.66 | 1.67 | 1.67 | 0.00 | 762.68 | 24.76 | 6.67 | 18.09 |
| 761.68 | 2.00 | 2.00 | 0.00 | 762.70 | 25.57 | 6.69 | 18.88 |
| 761.70 | 2.34 | 2.34 | 0.00 | 762.72 | 26.39 | 6.70 | 19.69 |
| 761.72 | 2.70 | 2.70 | 0.00 | 762.74 | 27.22 | 6.72 | 20.51 |
| 761.74 | 3.08 | 3.08 | 0.00 | 762.76 | 28.07 | 6.73 | 21.34 |
| 761.76 | 3.47 | 3.47 | 0.00 | 762.78 | 28.92 | 6.74 | 22.17 |
| 761.78 | 3.88 | 3.88 | 0.00 | 762.80 | 29.78 | 6.76 | 23.02 |
| 761.80 | 4.30 | 4.30 | 0.00 | 762.82 | 30.65 | 6.77 | 23.88 |
| 761.82 | 4.74 | 4.74 | 0.00 | 762.84 | 31.54 | 6.79 | 24.75 |
| 761.84 | 5.19 | 5.19 | 0.00 | 762.86 | 32.43 | 6.80 | 25.63 |
| 761.86 | 5.65 | 5.65 | 0.00 | 762.88 | 33.33 | 6.81 | 26.52 |
| 761.88 | 6.08 | 6.08 | 0.00 | 762.90 | 34.25 | 6.83 | 27.42 |
| 761.90 | 6.09 | 6.09 | 0.00 | 762.92 | 35.17 | 6.84 | 28.32 |
| 761.92 | 6.11 | 6.11 | 0.00 | 762.94 | 36.10 | 6.86 | 29.24 |
| 761.94 | 6.12 | 6.12 | 0.00 | 762.96 | 37.04 | 6.87 | 30.17 |
| 761.96 | 6.14 | 6.14 | 0.00 | 762.98 | 37.99 | 6.88 | 31.10 |
| 761.98 | 6.15 | 6.15 | 0.00 | 763.00 | 38.94 | 6.90 | 32.05 |
| 762.00 | 6.17 | 6.17 | 0.00 | | | | |

Proposed Conditions II

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Proposed Conditions - II
Type II 24-hr 10-yr Rainfall=3.15"

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Stage-Area-Storage for Pond B-6: Bioretention B-6

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 761.00 | 8,000 | 0 | 762.02 | 9,244 | 8,795 |
| 761.02 | 8,024 | 160 | 762.04 | 9,269 | 8,980 |
| 761.04 | 8,049 | 321 | 762.06 | 9,293 | 9,165 |
| 761.06 | 8,073 | 482 | 762.08 | 9,318 | 9,352 |
| 761.08 | 8,098 | 644 | 762.10 | 9,342 | 9,538 |
| 761.10 | 8,122 | 806 | 762.12 | 9,366 | 9,725 |
| 761.12 | 8,146 | 969 | 762.14 | 9,391 | 9,913 |
| 761.14 | 8,171 | 1,132 | 762.16 | 9,415 | 10,101 |
| 761.16 | 8,195 | 1,296 | 762.18 | 9,440 | 10,289 |
| 761.18 | 8,220 | 1,460 | 762.20 | 9,464 | 10,478 |
| 761.20 | 8,244 | 1,624 | 762.22 | 9,488 | 10,668 |
| 761.22 | 8,268 | 1,790 | 762.24 | 9,513 | 10,858 |
| 761.24 | 8,293 | 1,955 | 762.26 | 9,537 | 11,048 |
| 761.26 | 8,317 | 2,121 | 762.28 | 9,562 | 11,239 |
| 761.28 | 8,342 | 2,288 | 762.30 | 9,586 | 11,431 |
| 761.30 | 8,366 | 2,455 | 762.32 | 9,610 | 11,623 |
| 761.32 | 8,390 | 2,622 | 762.34 | 9,635 | 11,815 |
| 761.34 | 8,415 | 2,791 | 762.36 | 9,659 | 12,008 |
| 761.36 | 8,439 | 2,959 | 762.38 | 9,684 | 12,202 |
| 761.38 | 8,464 | 3,128 | 762.40 | 9,708 | 12,396 |
| 761.40 | 8,488 | 3,298 | 762.42 | 9,732 | 12,590 |
| 761.42 | 8,512 | 3,468 | 762.44 | 9,757 | 12,785 |
| 761.44 | 8,537 | 3,638 | 762.46 | 9,781 | 12,980 |
| 761.46 | 8,561 | 3,809 | 762.48 | 9,806 | 13,176 |
| 761.48 | 8,586 | 3,981 | 762.50 | 9,830 | 13,373 |
| 761.50 | 8,610 | 4,153 | 762.52 | 9,854 | 13,569 |
| 761.52 | 8,634 | 4,325 | 762.54 | 9,879 | 13,767 |
| 761.54 | 8,659 | 4,498 | 762.56 | 9,903 | 13,964 |
| 761.56 | 8,683 | 4,671 | 762.58 | 9,928 | 14,163 |
| 761.58 | 8,708 | 4,845 | 762.60 | 9,952 | 14,362 |
| 761.60 | 8,732 | 5,020 | 762.62 | 9,976 | 14,561 |
| 761.62 | 8,756 | 5,194 | 762.64 | 10,001 | 14,761 |
| 761.64 | 8,781 | 5,370 | 762.66 | 10,025 | 14,961 |
| 761.66 | 8,805 | 5,546 | 762.68 | 10,050 | 15,162 |
| 761.68 | 8,830 | 5,722 | 762.70 | 10,074 | 15,363 |
| 761.70 | 8,854 | 5,899 | 762.72 | 10,098 | 15,565 |
| 761.72 | 8,878 | 6,076 | 762.74 | 10,123 | 15,767 |
| 761.74 | 8,903 | 6,254 | 762.76 | 10,147 | 15,970 |
| 761.76 | 8,927 | 6,432 | 762.78 | 10,172 | 16,173 |
| 761.78 | 8,952 | 6,611 | 762.80 | 10,196 | 16,376 |
| 761.80 | 8,976 | 6,790 | 762.82 | 10,220 | 16,581 |
| 761.82 | 9,000 | 6,970 | 762.84 | 10,245 | 16,785 |
| 761.84 | 9,025 | 7,150 | 762.86 | 10,269 | 16,990 |
| 761.86 | 9,049 | 7,331 | 762.88 | 10,294 | 17,196 |
| 761.88 | 9,074 | 7,512 | 762.90 | 10,318 | 17,402 |
| 761.90 | 9,098 | 7,694 | 762.92 | 10,342 | 17,609 |
| 761.92 | 9,122 | 7,876 | 762.94 | 10,367 | 17,816 |
| 761.94 | 9,147 | 8,059 | 762.96 | 10,391 | 18,023 |
| 761.96 | 9,171 | 8,242 | 762.98 | 10,416 | 18,231 |
| 761.98 | 9,196 | 8,426 | 763.00 | 10,440 | 18,440 |
| 762.00 | 9,220 | 8,610 | | | |

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Summary for Link 2AR: 2A Reach

Inflow Area = 43.007 ac, 86.82% Impervious, Inflow Depth = 2.67" for 10-yr event
Inflow = 118.34 cfs @ 12.12 hrs, Volume= 9.581 af
Primary = 116.85 cfs @ 12.23 hrs, Volume= 9.581 af, Atten= 1%, Lag= 7.0 min

Primary outflow = Inflow delayed by 6.9 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - II

Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Link 2AT: DA 2A Total

Inflow Area = 43.007 ac, 86.82% Impervious, Inflow Depth = 2.67" for 10-yr event
Inflow = 118.34 cfs @ 12.12 hrs, Volume= 9.581 af
Primary = 118.34 cfs @ 12.12 hrs, Volume= 9.581 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - II

Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Link 2BP: Bypass

Inflow Area = 17.418 ac, 99.32% Impervious, Inflow Depth = 2.92" for 10-yr event
Inflow = 75.39 cfs @ 11.96 hrs, Volume= 4.235 af
Primary = 71.09 cfs @ 11.97 hrs, Volume= 4.215 af, Atten= 6%, Lag= 0.7 min
Secondary = 4.83 cfs @ 11.95 hrs, Volume= 0.020 af

Primary outflow = Inflow below 70.00 cfs, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - II

Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Link 2BR: 2BR

Inflow Area = 11.872 ac, 100.00% Impervious, Inflow Depth = 2.92" for 10-yr event
Inflow = 51.38 cfs @ 11.96 hrs, Volume= 2.887 af
Primary = 49.89 cfs @ 12.09 hrs, Volume= 2.887 af, Atten= 3%, Lag= 8.0 min

Primary outflow = Inflow delayed by 8.0 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - II

Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Link 2DT: DA 2D Total

Inflow Area = 17.418 ac, 99.32% Impervious, Inflow Depth = 2.92" for 10-yr event
Inflow = 73.65 cfs @ 11.98 hrs, Volume= 4.235 af
Primary = 73.65 cfs @ 11.98 hrs, Volume= 4.235 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - II

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Summary for Link DP-2: DP #2 - Smokes Crk

Inflow Area = 83.814 ac, 88.53% Impervious, Inflow Depth = 2.70" for 10-yr event
Inflow = 193.21 cfs @ 12.00 hrs, Volume= 18.824 af
Primary = 193.21 cfs @ 12.00 hrs, Volume= 18.824 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

Proposed Conditions II

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Proposed Conditions - II

Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 2A-I: DA #2A-I

Runoff = 139.28 cfs @ 12.12 hrs, Volume= 11.379 af, Depth= 3.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.883 | 74 | >75% Grass cover, Good, HSG C |
| 3.754 | 80 | >75% Grass cover, Good, HSG D |
| 5.748 | 98 | Paved parking, HSG C |
| 29.010 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.632 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 40.027 | 96 | Weighted Average |
| 5.269 | | 13.16% Pervious Area |
| 34.758 | | 86.84% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 1.9 | 98 | 0.0100 | 0.86 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 13.7 | 65 | 0.0150 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 0.8 | 80 | 0.0100 | 1.61 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 2.1 | 320 | 0.0150 | 2.49 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 1.7 | 446 | | 4.50 | | Direct Entry, Pipe Flow |
| 20.2 | 1,009 | Total | | | |

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Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 2A-II: DA #2A-II

Runoff = 15.55 cfs @ 11.96 hrs, Volume= 0.847 af, Depth= 3.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.400 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 2.580 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 2.980 | 96 | Weighted Average |
| 0.400 | | 13.42% Pervious Area |
| 2.580 | | 86.58% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|--|-------------------|----------------|--|
| 1.6 | 100 | 0.0150 | 1.02 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 3.0 | 450 | 0.0150 | 2.49 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 4.6 | 550 | Total, Increased to minimum Tc = 6.0 min | | | |

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Proposed Conditions - II

Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 2B: DA #2B

Runoff = 63.39 cfs @ 11.96 hrs, Volume= 3.597 af, Depth= 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.000 | 80 | >75% Grass cover, Good, HSG D |
| 2.682 | 98 | Paved parking, HSG C |
| 9.190 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 11.872 | 98 | Weighted Average |
| 11.872 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.9 | 100 | 0.0100 | 0.86 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 1.6 | 200 | 0.0100 | 2.03 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 3.5 | 300 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - II

Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 2C: DA #2C

Runoff = 54.38 cfs @ 11.97 hrs, Volume= 2.777 af, Depth= 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.913 | 74 | >75% Grass cover, Good, HSG C |
| 2.316 | 80 | >75% Grass cover, Good, HSG D |
| 1.729 | 98 | Paved parking, HSG C |
| 5.964 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.595 | 77 | Woods, Good, HSG D |
| 11.517 | 91 | Weighted Average |
| 3.824 | | 33.20% Pervious Area |
| 7.693 | | 66.80% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.9 | 100 | 0.0100 | 0.86 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 1.6 | 200 | 0.0100 | 2.03 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 3.5 | 300 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - II

Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 2D: DA #2D

Runoff = 93.00 cfs @ 11.96 hrs, Volume= 5.277 af, Depth= 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.118 | 80 | >75% Grass cover, Good, HSG D |
| 10.554 | 98 | Paved parking, HSG C |
| 6.746 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 17.418 | 98 | Weighted Average |
| 0.118 | | 0.68% Pervious Area |
| 17.300 | | 99.32% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.9 | 98 | 0.0100 | 0.86 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 1.7 | 446 | | 4.50 | | Direct Entry, Pipe Flow |
| 3.6 | 544 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - II
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Pond 1P: Chambers

Inflow = 23.00 cfs @ 11.96 hrs, Volume= 0.176 af
Outflow = 10.78 cfs @ 12.02 hrs, Volume= 0.175 af, Atten= 53%, Lag= 3.3 min
Primary = 10.78 cfs @ 12.02 hrs, Volume= 0.175 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 749.44' @ 12.02 hrs Surf.Area= 5,210 sf Storage= 4,543 cf

Plug-Flow detention time= 16.3 min calculated for 0.175 af (100% of inflow)
Center-of-Mass det. time= 16.0 min (733.9 - 717.8)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|---|
| #1A | 748.00' | 5,151 cf | 58.50'W x 89.06'L x 3.75'H Field A 19,537 cf Overall - 6,658 cf Embedded = 12,878 cf x 40.0% Voids |
| #2A | 748.75' | 6,658 cf | ADS_StormTech DC-780 +Cap x 144 Inside #1 Effective Size= 45.4"W x 30.0"H => 6.49 sf x 7.12'L = 46.2 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 144 Chambers in 12 Rows |
| | | 11,810 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

| Device | Routing | Invert | Outlet Devices |
|--------|---------|---------|--|
| #1 | Primary | 748.00' | 36.0" Round Culvert L= 165.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 748.00' / 747.35' S= 0.0039 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf |

Primary OutFlow Max=10.03 cfs @ 12.02 hrs HW=749.38' TW=0.00' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 10.03 cfs @ 4.65 fps)

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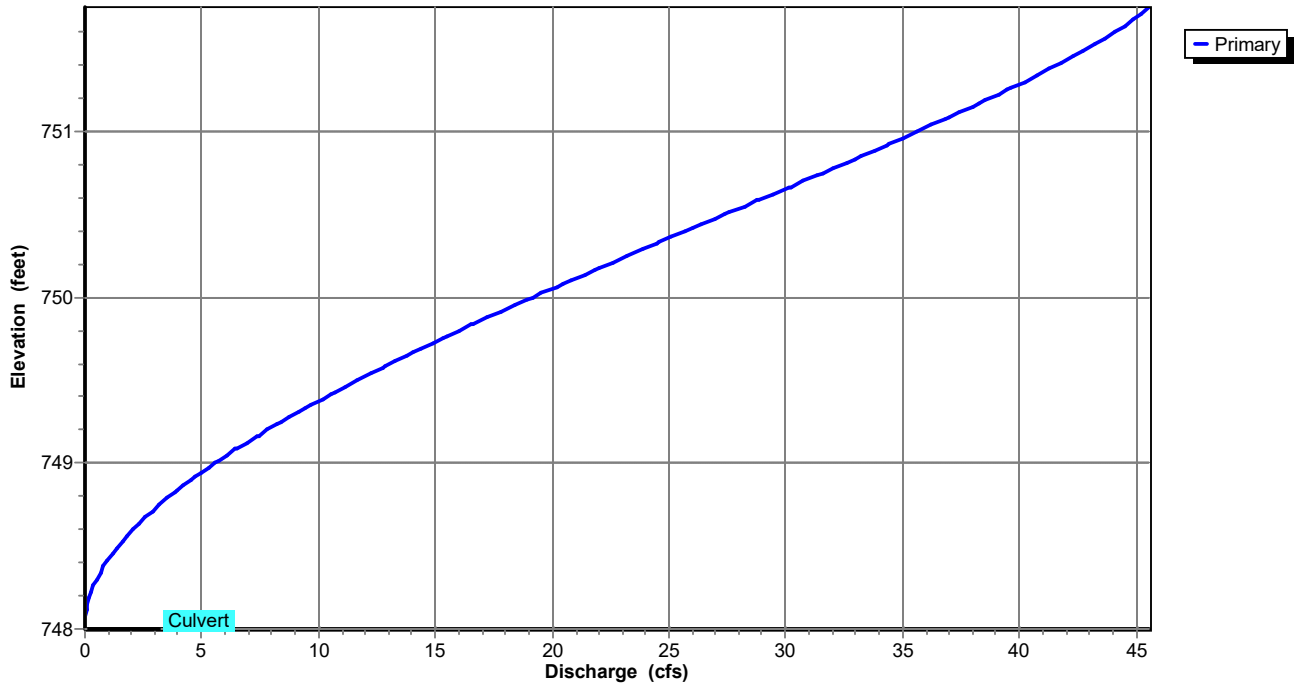
Proposed Conditions - II
Type II 24-hr 25-yr Rainfall=3.87"

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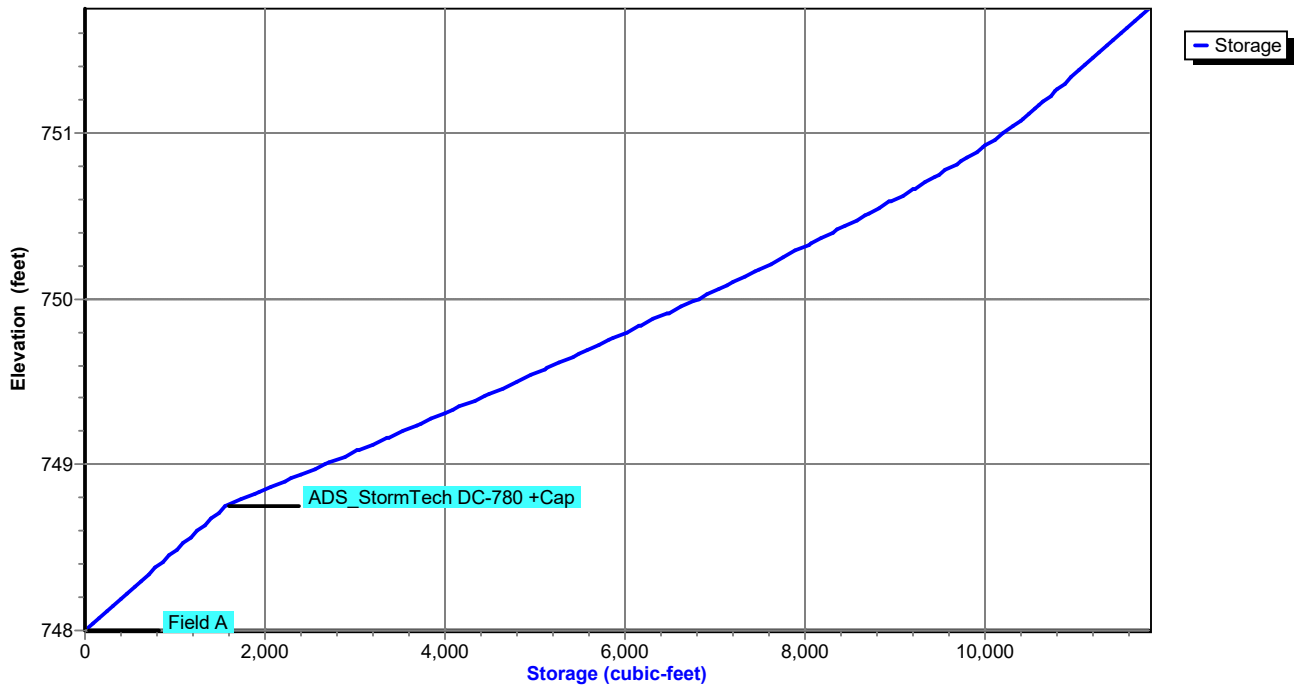
Pond 1P: Chambers

Stage-Discharge



Pond 1P: Chambers

Stage-Area-Storage



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Type II 24-hr 25-yr Rainfall=3.87"

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Stage-Discharge for Pond 1P: Chambers

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|
| 748.00 | 0.00 | 749.02 | 5.77 | 750.04 | 19.80 | 751.06 | 36.60 |
| 748.02 | 0.00 | 749.04 | 5.99 | 750.06 | 20.12 | 751.08 | 36.91 |
| 748.04 | 0.01 | 749.06 | 6.20 | 750.08 | 20.44 | 751.10 | 37.22 |
| 748.06 | 0.02 | 749.08 | 6.42 | 750.10 | 20.76 | 751.12 | 37.53 |
| 748.08 | 0.03 | 749.10 | 6.65 | 750.12 | 21.09 | 751.14 | 37.84 |
| 748.10 | 0.05 | 749.12 | 6.87 | 750.14 | 21.41 | 751.16 | 38.14 |
| 748.12 | 0.07 | 749.14 | 7.10 | 750.16 | 21.74 | 751.18 | 38.45 |
| 748.14 | 0.10 | 749.16 | 7.33 | 750.18 | 22.07 | 751.20 | 38.75 |
| 748.16 | 0.13 | 749.18 | 7.57 | 750.20 | 22.40 | 751.22 | 39.05 |
| 748.18 | 0.17 | 749.20 | 7.81 | 750.22 | 22.73 | 751.24 | 39.34 |
| 748.20 | 0.22 | 749.22 | 8.05 | 750.24 | 23.05 | 751.26 | 39.63 |
| 748.22 | 0.26 | 749.24 | 8.29 | 750.26 | 23.39 | 751.28 | 39.92 |
| 748.24 | 0.32 | 749.26 | 8.53 | 750.28 | 23.72 | 751.30 | 40.21 |
| 748.26 | 0.37 | 749.28 | 8.78 | 750.30 | 24.05 | 751.32 | 40.50 |
| 748.28 | 0.44 | 749.30 | 9.03 | 750.32 | 24.38 | 751.34 | 40.78 |
| 748.30 | 0.50 | 749.32 | 9.29 | 750.34 | 24.71 | 751.36 | 41.06 |
| 748.32 | 0.58 | 749.34 | 9.54 | 750.36 | 25.05 | 751.38 | 41.33 |
| 748.34 | 0.65 | 749.36 | 9.80 | 750.38 | 25.38 | 751.40 | 41.60 |
| 748.36 | 0.74 | 749.38 | 10.06 | 750.40 | 25.71 | 751.42 | 41.87 |
| 748.38 | 0.82 | 749.40 | 10.33 | 750.42 | 26.05 | 751.44 | 42.13 |
| 748.40 | 0.91 | 749.42 | 10.59 | 750.44 | 26.38 | 751.46 | 42.39 |
| 748.42 | 1.01 | 749.44 | 10.86 | 750.46 | 26.72 | 751.48 | 42.65 |
| 748.44 | 1.11 | 749.46 | 11.13 | 750.48 | 27.05 | 751.50 | 42.90 |
| 748.46 | 1.21 | 749.48 | 11.40 | 750.50 | 27.39 | 751.52 | 43.14 |
| 748.48 | 1.32 | 749.50 | 11.68 | 750.52 | 27.72 | 751.54 | 43.38 |
| 748.50 | 1.44 | 749.52 | 11.95 | 750.54 | 28.06 | 751.56 | 43.62 |
| 748.52 | 1.55 | 749.54 | 12.23 | 750.56 | 28.39 | 751.58 | 43.85 |
| 748.54 | 1.68 | 749.56 | 12.51 | 750.58 | 28.73 | 751.60 | 44.07 |
| 748.56 | 1.80 | 749.58 | 12.80 | 750.60 | 29.06 | 751.62 | 44.29 |
| 748.58 | 1.93 | 749.60 | 13.08 | 750.62 | 29.40 | 751.64 | 44.50 |
| 748.60 | 2.07 | 749.62 | 13.37 | 750.64 | 29.73 | 751.66 | 44.71 |
| 748.62 | 2.21 | 749.64 | 13.66 | 750.66 | 30.07 | 751.68 | 44.91 |
| 748.64 | 2.35 | 749.66 | 13.95 | 750.68 | 30.40 | 751.70 | 45.10 |
| 748.66 | 2.50 | 749.68 | 14.24 | 750.70 | 30.74 | 751.72 | 45.28 |
| 748.68 | 2.65 | 749.70 | 14.54 | 750.72 | 31.07 | 751.74 | 45.45 |
| 748.70 | 2.80 | 749.72 | 14.84 | 750.74 | 31.40 | | |
| 748.72 | 2.96 | 749.74 | 15.13 | 750.76 | 31.73 | | |
| 748.74 | 3.12 | 749.76 | 15.43 | 750.78 | 32.06 | | |
| 748.76 | 3.29 | 749.78 | 15.74 | 750.80 | 32.40 | | |
| 748.78 | 3.46 | 749.80 | 16.04 | 750.82 | 32.73 | | |
| 748.80 | 3.63 | 749.82 | 16.35 | 750.84 | 33.05 | | |
| 748.82 | 3.81 | 749.84 | 16.65 | 750.86 | 33.38 | | |
| 748.84 | 3.99 | 749.86 | 16.96 | 750.88 | 33.71 | | |
| 748.86 | 4.18 | 749.88 | 17.27 | 750.90 | 34.04 | | |
| 748.88 | 4.36 | 749.90 | 17.58 | 750.92 | 34.36 | | |
| 748.90 | 4.56 | 749.92 | 17.89 | 750.94 | 34.68 | | |
| 748.92 | 4.75 | 749.94 | 18.21 | 750.96 | 35.01 | | |
| 748.94 | 4.95 | 749.96 | 18.52 | 750.98 | 35.33 | | |
| 748.96 | 5.15 | 749.98 | 18.84 | 751.00 | 35.65 | | |
| 748.98 | 5.35 | 750.00 | 19.16 | 751.02 | 35.97 | | |
| 749.00 | 5.56 | 750.02 | 19.48 | 751.04 | 36.28 | | |

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Proposed Conditions - II
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Stage-Area-Storage for Pond 1P: Chambers

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---------------------|-------------------------|---------------------|-------------------------|
| 748.00 | 0 | 750.55 | 8,820 |
| 748.05 | 104 | 750.60 | 8,989 |
| 748.10 | 208 | 750.65 | 9,154 |
| 748.15 | 313 | 750.70 | 9,317 |
| 748.20 | 417 | 750.75 | 9,476 |
| 748.25 | 521 | 750.80 | 9,631 |
| 748.30 | 625 | 750.85 | 9,782 |
| 748.35 | 729 | 750.90 | 9,927 |
| 748.40 | 834 | 750.95 | 10,067 |
| 748.45 | 938 | 751.00 | 10,198 |
| 748.50 | 1,042 | 751.05 | 10,322 |
| 748.55 | 1,146 | 751.10 | 10,440 |
| 748.60 | 1,250 | 751.15 | 10,552 |
| 748.65 | 1,355 | 751.20 | 10,662 |
| 748.70 | 1,459 | 751.25 | 10,768 |
| 748.75 | 1,563 | 751.30 | 10,872 |
| 748.80 | 1,783 | 751.35 | 10,976 |
| 748.85 | 2,003 | 751.40 | 11,080 |
| 748.90 | 2,223 | 751.45 | 11,185 |
| 748.95 | 2,441 | 751.50 | 11,289 |
| 749.00 | 2,659 | 751.55 | 11,393 |
| 749.05 | 2,876 | 751.60 | 11,497 |
| 749.10 | 3,092 | 751.65 | 11,601 |
| 749.15 | 3,308 | 751.70 | 11,706 |
| 749.20 | 3,522 | 751.75 | 11,810 |
| 749.25 | 3,736 | | |
| 749.30 | 3,949 | | |
| 749.35 | 4,161 | | |
| 749.40 | 4,371 | | |
| 749.45 | 4,581 | | |
| 749.50 | 4,790 | | |
| 749.55 | 4,997 | | |
| 749.60 | 5,204 | | |
| 749.65 | 5,408 | | |
| 749.70 | 5,612 | | |
| 749.75 | 5,814 | | |
| 749.80 | 6,015 | | |
| 749.85 | 6,215 | | |
| 749.90 | 6,413 | | |
| 749.95 | 6,610 | | |
| 750.00 | 6,805 | | |
| 750.05 | 6,998 | | |
| 750.10 | 7,190 | | |
| 750.15 | 7,380 | | |
| 750.20 | 7,568 | | |
| 750.25 | 7,753 | | |
| 750.30 | 7,937 | | |
| 750.35 | 8,119 | | |
| 750.40 | 8,298 | | |
| 750.45 | 8,475 | | |
| 750.50 | 8,649 | | |

Proposed Conditions II

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Proposed Conditions - II
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Pond B-6: Bioretention B-6

Inflow Area = 2.980 ac, 86.58% Impervious, Inflow Depth = 3.41" for 25-yr event
Inflow = 15.55 cfs @ 11.96 hrs, Volume= 0.847 af
Outflow = 10.36 cfs @ 12.04 hrs, Volume= 0.752 af, Atten= 33%, Lag= 4.9 min
Primary = 6.36 cfs @ 12.04 hrs, Volume= 0.702 af
Secondary = 4.00 cfs @ 12.04 hrs, Volume= 0.049 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 762.25' @ 12.04 hrs Surf.Area= 9,522 sf Storage= 10,929 cf

Plug-Flow detention time= 110.5 min calculated for 0.751 af (89% of inflow)
Center-of-Mass det. time= 54.8 min (820.0 - 765.2)

| Volume | Invert | Avail.Storage | Storage Description |
|---------------------|----------------------|---------------------------|--|
| #1 | 761.00' | 18,440 cf | Surf. Storage (Prismatic) Listed below (Recalc) |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 761.00 | 8,000 | 0 | 0 |
| 763.00 | 10,440 | 18,440 | 18,440 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|--|
| #1 | Primary | 758.00' | 12.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 758.00' / 757.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf |
| #2 | Device 1 | 761.50' | 24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads |
| #3 | Secondary | 762.00' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=6.35 cfs @ 12.04 hrs HW=762.24' TW=0.00' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 6.35 cfs @ 8.09 fps)

↑**2=Grate** (Passes 6.35 cfs of 16.59 cfs potential flow)

Secondary OutFlow Max=3.88 cfs @ 12.04 hrs HW=762.24' TW=0.00' (Dynamic Tailwater)

↑**3=Sharp-Crested Rectangular Weir** (Weir Controls 3.88 cfs @ 1.61 fps)

Proposed Conditions II

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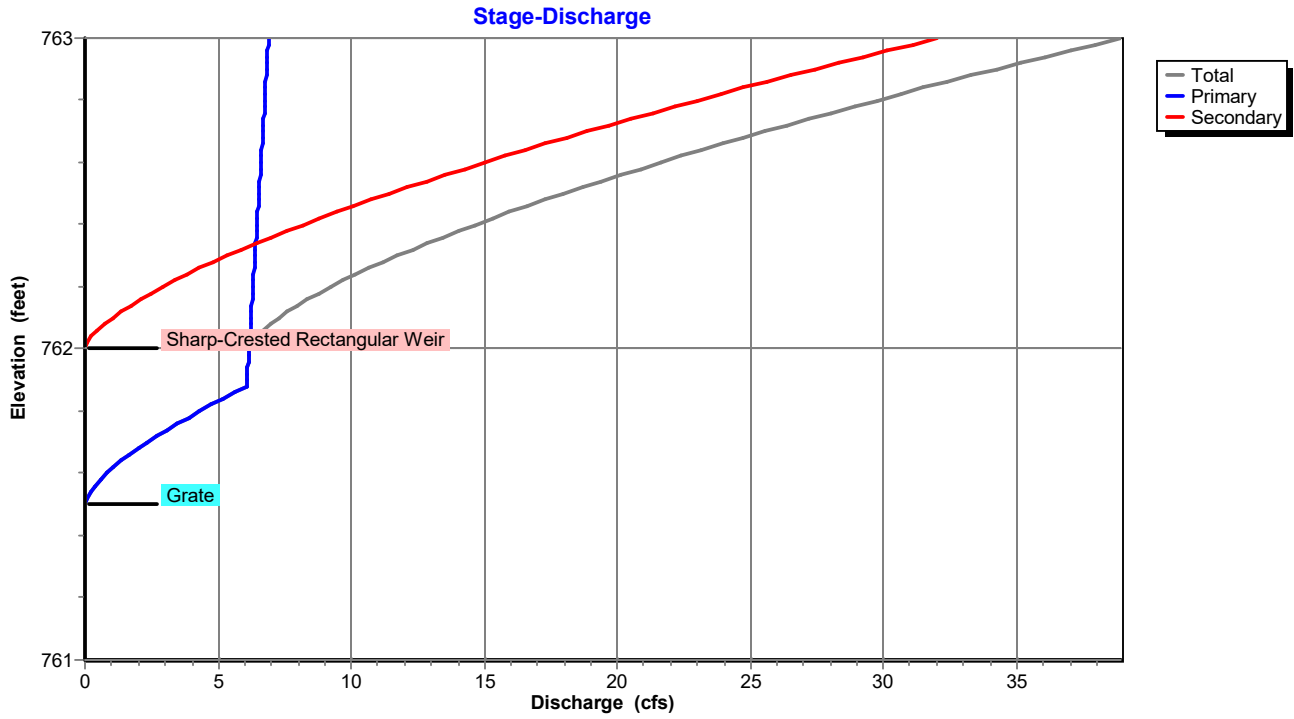
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Proposed Conditions - II
Type II 24-hr 25-yr Rainfall=3.87"

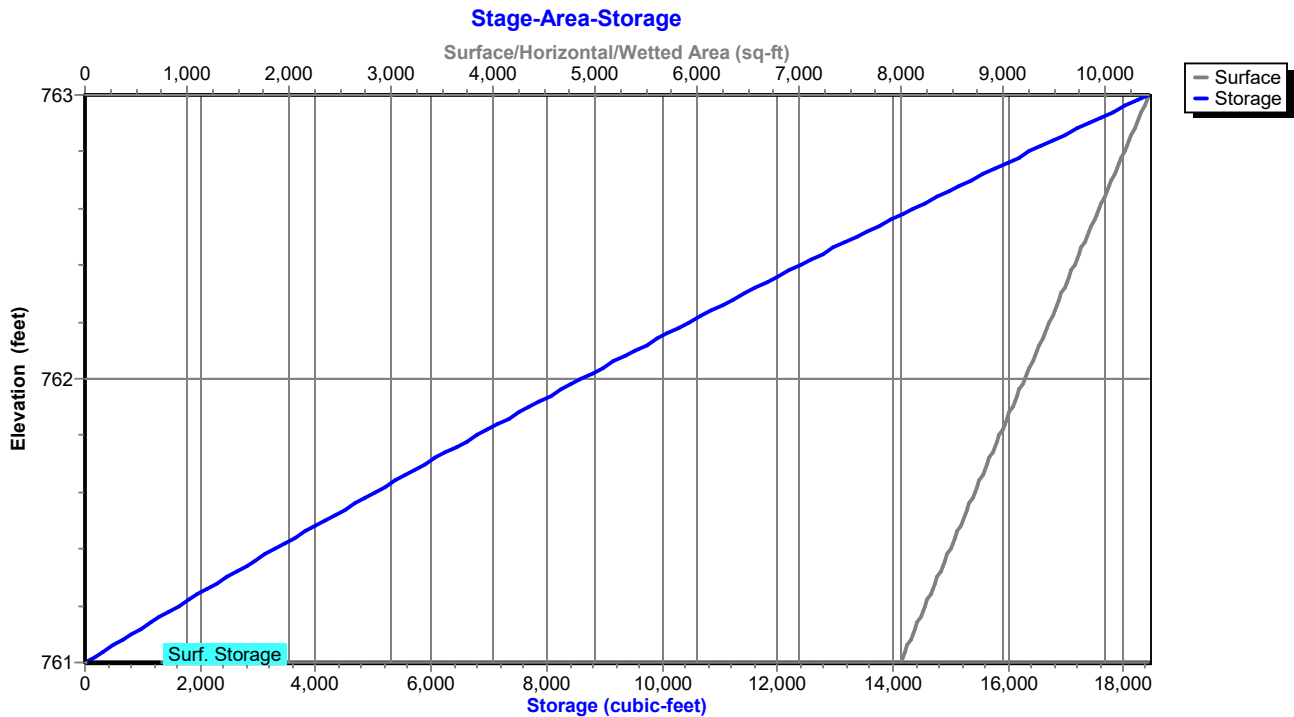
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Pond B-6: Bioretention B-6



Pond B-6: Bioretention B-6



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Proposed Conditions - II
 Type II 24-hr 25-yr Rainfall=3.87"

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Stage-Discharge for Pond B-6: Bioretention B-6

| Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) | Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) |
|---------------------|--------------------|------------------|--------------------|---------------------|--------------------|------------------|--------------------|
| 761.00 | 0.00 | 0.00 | 0.00 | 762.02 | 6.28 | 6.18 | 0.09 |
| 761.02 | 0.00 | 0.00 | 0.00 | 762.04 | 6.46 | 6.20 | 0.26 |
| 761.04 | 0.00 | 0.00 | 0.00 | 762.06 | 6.70 | 6.22 | 0.48 |
| 761.06 | 0.00 | 0.00 | 0.00 | 762.08 | 6.97 | 6.23 | 0.74 |
| 761.08 | 0.00 | 0.00 | 0.00 | 762.10 | 7.28 | 6.25 | 1.03 |
| 761.10 | 0.00 | 0.00 | 0.00 | 762.12 | 7.62 | 6.26 | 1.36 |
| 761.12 | 0.00 | 0.00 | 0.00 | 762.14 | 7.98 | 6.28 | 1.71 |
| 761.14 | 0.00 | 0.00 | 0.00 | 762.16 | 8.38 | 6.29 | 2.09 |
| 761.16 | 0.00 | 0.00 | 0.00 | 762.18 | 8.79 | 6.31 | 2.49 |
| 761.18 | 0.00 | 0.00 | 0.00 | 762.20 | 9.23 | 6.32 | 2.91 |
| 761.20 | 0.00 | 0.00 | 0.00 | 762.22 | 9.70 | 6.34 | 3.36 |
| 761.22 | 0.00 | 0.00 | 0.00 | 762.24 | 10.18 | 6.35 | 3.83 |
| 761.24 | 0.00 | 0.00 | 0.00 | 762.26 | 10.68 | 6.37 | 4.31 |
| 761.26 | 0.00 | 0.00 | 0.00 | 762.28 | 11.20 | 6.38 | 4.82 |
| 761.28 | 0.00 | 0.00 | 0.00 | 762.30 | 11.74 | 6.40 | 5.34 |
| 761.30 | 0.00 | 0.00 | 0.00 | 762.32 | 12.29 | 6.41 | 5.88 |
| 761.32 | 0.00 | 0.00 | 0.00 | 762.34 | 12.86 | 6.43 | 6.44 |
| 761.34 | 0.00 | 0.00 | 0.00 | 762.36 | 13.45 | 6.44 | 7.01 |
| 761.36 | 0.00 | 0.00 | 0.00 | 762.38 | 14.06 | 6.46 | 7.60 |
| 761.38 | 0.00 | 0.00 | 0.00 | 762.40 | 14.68 | 6.47 | 8.21 |
| 761.40 | 0.00 | 0.00 | 0.00 | 762.42 | 15.31 | 6.48 | 8.83 |
| 761.42 | 0.00 | 0.00 | 0.00 | 762.44 | 15.96 | 6.50 | 9.46 |
| 761.44 | 0.00 | 0.00 | 0.00 | 762.46 | 16.62 | 6.51 | 10.11 |
| 761.46 | 0.00 | 0.00 | 0.00 | 762.48 | 17.30 | 6.53 | 10.77 |
| 761.48 | 0.00 | 0.00 | 0.00 | 762.50 | 17.99 | 6.54 | 11.45 |
| 761.50 | 0.00 | 0.00 | 0.00 | 762.52 | 18.69 | 6.56 | 12.13 |
| 761.52 | 0.07 | 0.07 | 0.00 | 762.54 | 19.41 | 6.57 | 12.84 |
| 761.54 | 0.21 | 0.21 | 0.00 | 762.56 | 20.14 | 6.59 | 13.55 |
| 761.56 | 0.38 | 0.38 | 0.00 | 762.58 | 20.88 | 6.60 | 14.28 |
| 761.58 | 0.59 | 0.59 | 0.00 | 762.60 | 21.63 | 6.62 | 15.02 |
| 761.60 | 0.83 | 0.83 | 0.00 | 762.62 | 22.40 | 6.63 | 15.77 |
| 761.62 | 1.09 | 1.09 | 0.00 | 762.64 | 23.17 | 6.64 | 16.53 |
| 761.64 | 1.37 | 1.37 | 0.00 | 762.66 | 23.96 | 6.66 | 17.30 |
| 761.66 | 1.67 | 1.67 | 0.00 | 762.68 | 24.76 | 6.67 | 18.09 |
| 761.68 | 2.00 | 2.00 | 0.00 | 762.70 | 25.57 | 6.69 | 18.88 |
| 761.70 | 2.34 | 2.34 | 0.00 | 762.72 | 26.39 | 6.70 | 19.69 |
| 761.72 | 2.70 | 2.70 | 0.00 | 762.74 | 27.22 | 6.72 | 20.51 |
| 761.74 | 3.08 | 3.08 | 0.00 | 762.76 | 28.07 | 6.73 | 21.34 |
| 761.76 | 3.47 | 3.47 | 0.00 | 762.78 | 28.92 | 6.74 | 22.17 |
| 761.78 | 3.88 | 3.88 | 0.00 | 762.80 | 29.78 | 6.76 | 23.02 |
| 761.80 | 4.30 | 4.30 | 0.00 | 762.82 | 30.65 | 6.77 | 23.88 |
| 761.82 | 4.74 | 4.74 | 0.00 | 762.84 | 31.54 | 6.79 | 24.75 |
| 761.84 | 5.19 | 5.19 | 0.00 | 762.86 | 32.43 | 6.80 | 25.63 |
| 761.86 | 5.65 | 5.65 | 0.00 | 762.88 | 33.33 | 6.81 | 26.52 |
| 761.88 | 6.08 | 6.08 | 0.00 | 762.90 | 34.25 | 6.83 | 27.42 |
| 761.90 | 6.09 | 6.09 | 0.00 | 762.92 | 35.17 | 6.84 | 28.32 |
| 761.92 | 6.11 | 6.11 | 0.00 | 762.94 | 36.10 | 6.86 | 29.24 |
| 761.94 | 6.12 | 6.12 | 0.00 | 762.96 | 37.04 | 6.87 | 30.17 |
| 761.96 | 6.14 | 6.14 | 0.00 | 762.98 | 37.99 | 6.88 | 31.10 |
| 761.98 | 6.15 | 6.15 | 0.00 | 763.00 | 38.94 | 6.90 | 32.05 |
| 762.00 | 6.17 | 6.17 | 0.00 | | | | |

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Stage-Area-Storage for Pond B-6: Bioretention B-6

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 761.00 | 8,000 | 0 | 762.02 | 9,244 | 8,795 |
| 761.02 | 8,024 | 160 | 762.04 | 9,269 | 8,980 |
| 761.04 | 8,049 | 321 | 762.06 | 9,293 | 9,165 |
| 761.06 | 8,073 | 482 | 762.08 | 9,318 | 9,352 |
| 761.08 | 8,098 | 644 | 762.10 | 9,342 | 9,538 |
| 761.10 | 8,122 | 806 | 762.12 | 9,366 | 9,725 |
| 761.12 | 8,146 | 969 | 762.14 | 9,391 | 9,913 |
| 761.14 | 8,171 | 1,132 | 762.16 | 9,415 | 10,101 |
| 761.16 | 8,195 | 1,296 | 762.18 | 9,440 | 10,289 |
| 761.18 | 8,220 | 1,460 | 762.20 | 9,464 | 10,478 |
| 761.20 | 8,244 | 1,624 | 762.22 | 9,488 | 10,668 |
| 761.22 | 8,268 | 1,790 | 762.24 | 9,513 | 10,858 |
| 761.24 | 8,293 | 1,955 | 762.26 | 9,537 | 11,048 |
| 761.26 | 8,317 | 2,121 | 762.28 | 9,562 | 11,239 |
| 761.28 | 8,342 | 2,288 | 762.30 | 9,586 | 11,431 |
| 761.30 | 8,366 | 2,455 | 762.32 | 9,610 | 11,623 |
| 761.32 | 8,390 | 2,622 | 762.34 | 9,635 | 11,815 |
| 761.34 | 8,415 | 2,791 | 762.36 | 9,659 | 12,008 |
| 761.36 | 8,439 | 2,959 | 762.38 | 9,684 | 12,202 |
| 761.38 | 8,464 | 3,128 | 762.40 | 9,708 | 12,396 |
| 761.40 | 8,488 | 3,298 | 762.42 | 9,732 | 12,590 |
| 761.42 | 8,512 | 3,468 | 762.44 | 9,757 | 12,785 |
| 761.44 | 8,537 | 3,638 | 762.46 | 9,781 | 12,980 |
| 761.46 | 8,561 | 3,809 | 762.48 | 9,806 | 13,176 |
| 761.48 | 8,586 | 3,981 | 762.50 | 9,830 | 13,373 |
| 761.50 | 8,610 | 4,153 | 762.52 | 9,854 | 13,569 |
| 761.52 | 8,634 | 4,325 | 762.54 | 9,879 | 13,767 |
| 761.54 | 8,659 | 4,498 | 762.56 | 9,903 | 13,964 |
| 761.56 | 8,683 | 4,671 | 762.58 | 9,928 | 14,163 |
| 761.58 | 8,708 | 4,845 | 762.60 | 9,952 | 14,362 |
| 761.60 | 8,732 | 5,020 | 762.62 | 9,976 | 14,561 |
| 761.62 | 8,756 | 5,194 | 762.64 | 10,001 | 14,761 |
| 761.64 | 8,781 | 5,370 | 762.66 | 10,025 | 14,961 |
| 761.66 | 8,805 | 5,546 | 762.68 | 10,050 | 15,162 |
| 761.68 | 8,830 | 5,722 | 762.70 | 10,074 | 15,363 |
| 761.70 | 8,854 | 5,899 | 762.72 | 10,098 | 15,565 |
| 761.72 | 8,878 | 6,076 | 762.74 | 10,123 | 15,767 |
| 761.74 | 8,903 | 6,254 | 762.76 | 10,147 | 15,970 |
| 761.76 | 8,927 | 6,432 | 762.78 | 10,172 | 16,173 |
| 761.78 | 8,952 | 6,611 | 762.80 | 10,196 | 16,376 |
| 761.80 | 8,976 | 6,790 | 762.82 | 10,220 | 16,581 |
| 761.82 | 9,000 | 6,970 | 762.84 | 10,245 | 16,785 |
| 761.84 | 9,025 | 7,150 | 762.86 | 10,269 | 16,990 |
| 761.86 | 9,049 | 7,331 | 762.88 | 10,294 | 17,196 |
| 761.88 | 9,074 | 7,512 | 762.90 | 10,318 | 17,402 |
| 761.90 | 9,098 | 7,694 | 762.92 | 10,342 | 17,609 |
| 761.92 | 9,122 | 7,876 | 762.94 | 10,367 | 17,816 |
| 761.94 | 9,147 | 8,059 | 762.96 | 10,391 | 18,023 |
| 761.96 | 9,171 | 8,242 | 762.98 | 10,416 | 18,231 |
| 761.98 | 9,196 | 8,426 | 763.00 | 10,440 | 18,440 |
| 762.00 | 9,220 | 8,610 | | | |

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Proposed Conditions - II

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Summary for Link 2AR: 2A Reach

Inflow Area = 43.007 ac, 86.82% Impervious, Inflow Depth = 3.38" for 25-yr event
Inflow = 147.81 cfs @ 12.11 hrs, Volume= 12.130 af
Primary = 145.94 cfs @ 12.23 hrs, Volume= 12.130 af, Atten= 1%, Lag= 6.9 min

Primary outflow = Inflow delayed by 6.9 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Summary for Link 2AT: DA 2A Total

Inflow Area = 43.007 ac, 86.82% Impervious, Inflow Depth = 3.38" for 25-yr event
Inflow = 147.81 cfs @ 12.11 hrs, Volume= 12.130 af
Primary = 147.81 cfs @ 12.11 hrs, Volume= 12.130 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - II

Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Link 2BP: Bypass

Inflow Area = 17.418 ac, 99.32% Impervious, Inflow Depth = 3.64" for 25-yr event
Inflow = 93.00 cfs @ 11.96 hrs, Volume= 5.277 af
Primary = 70.00 cfs @ 11.90 hrs, Volume= 5.101 af, Atten= 25%, Lag= 0.0 min
Secondary = 23.00 cfs @ 11.96 hrs, Volume= 0.176 af

Primary outflow = Inflow below 70.00 cfs, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Link 2BR: 2BR

Inflow Area = 11.872 ac, 100.00% Impervious, Inflow Depth = 3.64" for 25-yr event
Inflow = 63.39 cfs @ 11.96 hrs, Volume= 3.597 af
Primary = 61.55 cfs @ 12.09 hrs, Volume= 3.597 af, Atten= 3%, Lag= 8.0 min

Primary outflow = Inflow delayed by 8.0 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - II

Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Link 2DT: DA 2D Total

Inflow Area = 17.418 ac, 99.32% Impervious, Inflow Depth = 3.64" for 25-yr event
Inflow = 81.21 cfs @ 11.99 hrs, Volume= 5.277 af
Primary = 81.21 cfs @ 11.99 hrs, Volume= 5.277 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - II

Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Link DP-2: DP #2 - Smokes Crk

Inflow Area = 83.814 ac, 88.53% Impervious, Inflow Depth = 3.40" for 25-yr event
Inflow = 236.58 cfs @ 12.02 hrs, Volume= 23.780 af
Primary = 236.58 cfs @ 12.02 hrs, Volume= 23.780 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - II
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 2A-I: DA #2A-I

Runoff = 192.64 cfs @ 12.12 hrs, Volume= 16.014 af, Depth= 4.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.883 | 74 | >75% Grass cover, Good, HSG C |
| 3.754 | 80 | >75% Grass cover, Good, HSG D |
| 5.748 | 98 | Paved parking, HSG C |
| 29.010 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.632 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 40.027 | 96 | Weighted Average |
| 5.269 | | 13.16% Pervious Area |
| 34.758 | | 86.84% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 1.9 | 98 | 0.0100 | 0.86 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 13.7 | 65 | 0.0150 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 0.8 | 80 | 0.0100 | 1.61 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 2.1 | 320 | 0.0150 | 2.49 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 1.7 | 446 | | 4.50 | | Direct Entry, Pipe Flow |
| 20.2 | 1,009 | Total | | | |

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Proposed Conditions - II
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 2A-II: DA #2A-II

Runoff = 21.46 cfs @ 11.96 hrs, Volume= 1.192 af, Depth= 4.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.400 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 2.580 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 2.980 | 96 | Weighted Average |
| 0.400 | | 13.42% Pervious Area |
| 2.580 | | 86.58% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.6 | 100 | 0.0150 | 1.02 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 3.0 | 450 | 0.0150 | 2.49 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 4.6 | 550 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - II

Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 2B: DA #2B

Runoff = 86.65 cfs @ 11.96 hrs, Volume= 4.979 af, Depth> 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.000 | 80 | >75% Grass cover, Good, HSG D |
| 2.682 | 98 | Paved parking, HSG C |
| 9.190 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 11.872 | 98 | Weighted Average |
| 11.872 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.9 | 100 | 0.0100 | 0.86 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 1.6 | 200 | 0.0100 | 2.03 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 3.5 | 300 | | | | Total, Increased to minimum Tc = 6.0 min |

Proposed Conditions II

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Proposed Conditions - II
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 2C: DA #2C

Runoff = 77.89 cfs @ 11.96 hrs, Volume= 4.074 af, Depth= 4.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.913 | 74 | >75% Grass cover, Good, HSG C |
| 2.316 | 80 | >75% Grass cover, Good, HSG D |
| 1.729 | 98 | Paved parking, HSG C |
| 5.964 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.595 | 77 | Woods, Good, HSG D |
| 11.517 | 91 | Weighted Average |
| 3.824 | | 33.20% Pervious Area |
| 7.693 | | 66.80% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.9 | 100 | 0.0100 | 0.86 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 1.6 | 200 | 0.0100 | 2.03 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 3.5 | 300 | | | | Total, Increased to minimum Tc = 6.0 min |

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Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 2D: DA #2D

Runoff = 127.13 cfs @ 11.96 hrs, Volume= 7.305 af, Depth> 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 0.118 | 80 | >75% Grass cover, Good, HSG D |
| 10.554 | 98 | Paved parking, HSG C |
| 6.746 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 17.418 | 98 | Weighted Average |
| 0.118 | | 0.68% Pervious Area |
| 17.300 | | 99.32% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.9 | 98 | 0.0100 | 0.86 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 1.7 | 446 | | 4.50 | | Direct Entry, Pipe Flow |
| 3.6 | 544 | | | | Total, Increased to minimum Tc = 6.0 min |

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Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Pond 1P: Chambers

Inflow = 57.13 cfs @ 11.96 hrs, Volume= 0.592 af
Outflow = 43.36 cfs @ 12.00 hrs, Volume= 0.592 af, Atten= 24%, Lag= 2.5 min
Primary = 43.36 cfs @ 12.00 hrs, Volume= 0.592 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 751.54' @ 12.00 hrs Surf.Area= 5,210 sf Storage= 11,362 cf

Plug-Flow detention time= 8.7 min calculated for 0.592 af (100% of inflow)
Center-of-Mass det. time= 8.1 min (725.4 - 717.2)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|---|
| #1A | 748.00' | 5,151 cf | 58.50'W x 89.06'L x 3.75'H Field A 19,537 cf Overall - 6,658 cf Embedded = 12,878 cf x 40.0% Voids |
| #2A | 748.75' | 6,658 cf | ADS_StormTech DC-780 +Cap x 144 Inside #1 Effective Size= 45.4"W x 30.0"H => 6.49 sf x 7.12'L = 46.2 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 144 Chambers in 12 Rows |
| | | 11,810 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

| Device | Routing | Invert | Outlet Devices |
|--------|---------|---------|--|
| #1 | Primary | 748.00' | 36.0" Round Culvert L= 165.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 748.00' / 747.35' S= 0.0039 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf |

Primary OutFlow Max=42.40 cfs @ 12.00 hrs HW=751.46' TW=0.00' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 42.40 cfs @ 6.52 fps)

Proposed Conditions II

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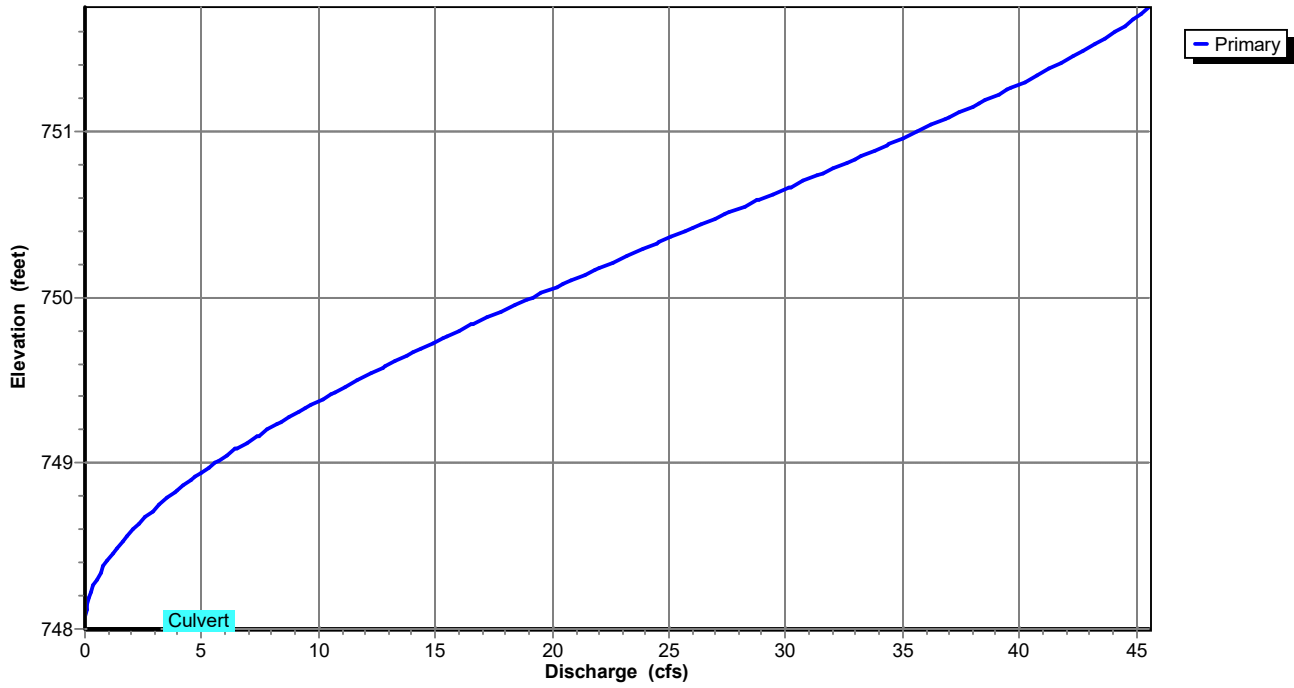
Proposed Conditions - II
Type II 24-hr 100-yr Rainfall=5.27"

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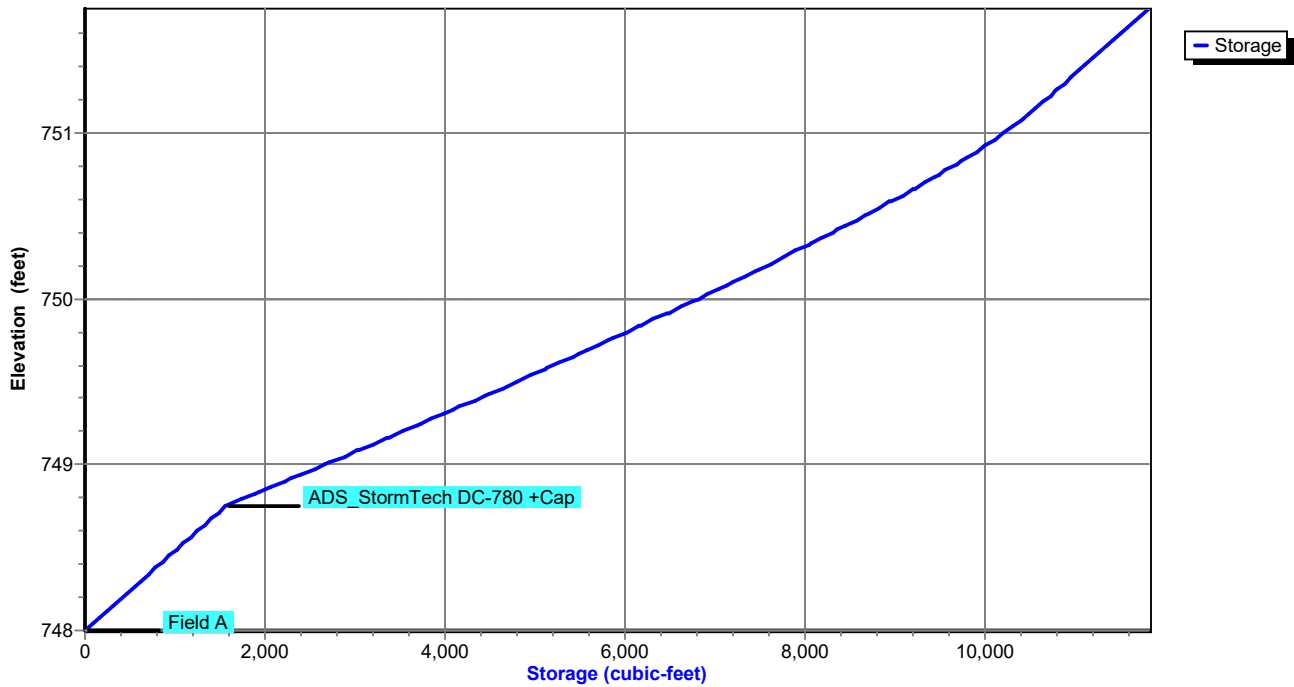
Pond 1P: Chambers

Stage-Discharge



Pond 1P: Chambers

Stage-Area-Storage



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Type II 24-hr 100-yr Rainfall=5.27"

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Stage-Discharge for Pond 1P: Chambers

| Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) | Elevation (feet) | Primary (cfs) |
|---------------------|------------------|---------------------|------------------|---------------------|------------------|---------------------|------------------|
| 748.00 | 0.00 | 749.02 | 5.77 | 750.04 | 19.80 | 751.06 | 36.60 |
| 748.02 | 0.00 | 749.04 | 5.99 | 750.06 | 20.12 | 751.08 | 36.91 |
| 748.04 | 0.01 | 749.06 | 6.20 | 750.08 | 20.44 | 751.10 | 37.22 |
| 748.06 | 0.02 | 749.08 | 6.42 | 750.10 | 20.76 | 751.12 | 37.53 |
| 748.08 | 0.03 | 749.10 | 6.65 | 750.12 | 21.09 | 751.14 | 37.84 |
| 748.10 | 0.05 | 749.12 | 6.87 | 750.14 | 21.41 | 751.16 | 38.14 |
| 748.12 | 0.07 | 749.14 | 7.10 | 750.16 | 21.74 | 751.18 | 38.45 |
| 748.14 | 0.10 | 749.16 | 7.33 | 750.18 | 22.07 | 751.20 | 38.75 |
| 748.16 | 0.13 | 749.18 | 7.57 | 750.20 | 22.40 | 751.22 | 39.05 |
| 748.18 | 0.17 | 749.20 | 7.81 | 750.22 | 22.73 | 751.24 | 39.34 |
| 748.20 | 0.22 | 749.22 | 8.05 | 750.24 | 23.05 | 751.26 | 39.63 |
| 748.22 | 0.26 | 749.24 | 8.29 | 750.26 | 23.39 | 751.28 | 39.92 |
| 748.24 | 0.32 | 749.26 | 8.53 | 750.28 | 23.72 | 751.30 | 40.21 |
| 748.26 | 0.37 | 749.28 | 8.78 | 750.30 | 24.05 | 751.32 | 40.50 |
| 748.28 | 0.44 | 749.30 | 9.03 | 750.32 | 24.38 | 751.34 | 40.78 |
| 748.30 | 0.50 | 749.32 | 9.29 | 750.34 | 24.71 | 751.36 | 41.06 |
| 748.32 | 0.58 | 749.34 | 9.54 | 750.36 | 25.05 | 751.38 | 41.33 |
| 748.34 | 0.65 | 749.36 | 9.80 | 750.38 | 25.38 | 751.40 | 41.60 |
| 748.36 | 0.74 | 749.38 | 10.06 | 750.40 | 25.71 | 751.42 | 41.87 |
| 748.38 | 0.82 | 749.40 | 10.33 | 750.42 | 26.05 | 751.44 | 42.13 |
| 748.40 | 0.91 | 749.42 | 10.59 | 750.44 | 26.38 | 751.46 | 42.39 |
| 748.42 | 1.01 | 749.44 | 10.86 | 750.46 | 26.72 | 751.48 | 42.65 |
| 748.44 | 1.11 | 749.46 | 11.13 | 750.48 | 27.05 | 751.50 | 42.90 |
| 748.46 | 1.21 | 749.48 | 11.40 | 750.50 | 27.39 | 751.52 | 43.14 |
| 748.48 | 1.32 | 749.50 | 11.68 | 750.52 | 27.72 | 751.54 | 43.38 |
| 748.50 | 1.44 | 749.52 | 11.95 | 750.54 | 28.06 | 751.56 | 43.62 |
| 748.52 | 1.55 | 749.54 | 12.23 | 750.56 | 28.39 | 751.58 | 43.85 |
| 748.54 | 1.68 | 749.56 | 12.51 | 750.58 | 28.73 | 751.60 | 44.07 |
| 748.56 | 1.80 | 749.58 | 12.80 | 750.60 | 29.06 | 751.62 | 44.29 |
| 748.58 | 1.93 | 749.60 | 13.08 | 750.62 | 29.40 | 751.64 | 44.50 |
| 748.60 | 2.07 | 749.62 | 13.37 | 750.64 | 29.73 | 751.66 | 44.71 |
| 748.62 | 2.21 | 749.64 | 13.66 | 750.66 | 30.07 | 751.68 | 44.91 |
| 748.64 | 2.35 | 749.66 | 13.95 | 750.68 | 30.40 | 751.70 | 45.10 |
| 748.66 | 2.50 | 749.68 | 14.24 | 750.70 | 30.74 | 751.72 | 45.28 |
| 748.68 | 2.65 | 749.70 | 14.54 | 750.72 | 31.07 | 751.74 | 45.45 |
| 748.70 | 2.80 | 749.72 | 14.84 | 750.74 | 31.40 | | |
| 748.72 | 2.96 | 749.74 | 15.13 | 750.76 | 31.73 | | |
| 748.74 | 3.12 | 749.76 | 15.43 | 750.78 | 32.06 | | |
| 748.76 | 3.29 | 749.78 | 15.74 | 750.80 | 32.40 | | |
| 748.78 | 3.46 | 749.80 | 16.04 | 750.82 | 32.73 | | |
| 748.80 | 3.63 | 749.82 | 16.35 | 750.84 | 33.05 | | |
| 748.82 | 3.81 | 749.84 | 16.65 | 750.86 | 33.38 | | |
| 748.84 | 3.99 | 749.86 | 16.96 | 750.88 | 33.71 | | |
| 748.86 | 4.18 | 749.88 | 17.27 | 750.90 | 34.04 | | |
| 748.88 | 4.36 | 749.90 | 17.58 | 750.92 | 34.36 | | |
| 748.90 | 4.56 | 749.92 | 17.89 | 750.94 | 34.68 | | |
| 748.92 | 4.75 | 749.94 | 18.21 | 750.96 | 35.01 | | |
| 748.94 | 4.95 | 749.96 | 18.52 | 750.98 | 35.33 | | |
| 748.96 | 5.15 | 749.98 | 18.84 | 751.00 | 35.65 | | |
| 748.98 | 5.35 | 750.00 | 19.16 | 751.02 | 35.97 | | |
| 749.00 | 5.56 | 750.02 | 19.48 | 751.04 | 36.28 | | |

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Proposed Conditions - II
Type II 24-hr 100-yr Rainfall=5.27"

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Stage-Area-Storage for Pond 1P: Chambers

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---------------------|-------------------------|---------------------|-------------------------|
| 748.00 | 0 | 750.55 | 8,820 |
| 748.05 | 104 | 750.60 | 8,989 |
| 748.10 | 208 | 750.65 | 9,154 |
| 748.15 | 313 | 750.70 | 9,317 |
| 748.20 | 417 | 750.75 | 9,476 |
| 748.25 | 521 | 750.80 | 9,631 |
| 748.30 | 625 | 750.85 | 9,782 |
| 748.35 | 729 | 750.90 | 9,927 |
| 748.40 | 834 | 750.95 | 10,067 |
| 748.45 | 938 | 751.00 | 10,198 |
| 748.50 | 1,042 | 751.05 | 10,322 |
| 748.55 | 1,146 | 751.10 | 10,440 |
| 748.60 | 1,250 | 751.15 | 10,552 |
| 748.65 | 1,355 | 751.20 | 10,662 |
| 748.70 | 1,459 | 751.25 | 10,768 |
| 748.75 | 1,563 | 751.30 | 10,872 |
| 748.80 | 1,783 | 751.35 | 10,976 |
| 748.85 | 2,003 | 751.40 | 11,080 |
| 748.90 | 2,223 | 751.45 | 11,185 |
| 748.95 | 2,441 | 751.50 | 11,289 |
| 749.00 | 2,659 | 751.55 | 11,393 |
| 749.05 | 2,876 | 751.60 | 11,497 |
| 749.10 | 3,092 | 751.65 | 11,601 |
| 749.15 | 3,308 | 751.70 | 11,706 |
| 749.20 | 3,522 | 751.75 | 11,810 |
| 749.25 | 3,736 | | |
| 749.30 | 3,949 | | |
| 749.35 | 4,161 | | |
| 749.40 | 4,371 | | |
| 749.45 | 4,581 | | |
| 749.50 | 4,790 | | |
| 749.55 | 4,997 | | |
| 749.60 | 5,204 | | |
| 749.65 | 5,408 | | |
| 749.70 | 5,612 | | |
| 749.75 | 5,814 | | |
| 749.80 | 6,015 | | |
| 749.85 | 6,215 | | |
| 749.90 | 6,413 | | |
| 749.95 | 6,610 | | |
| 750.00 | 6,805 | | |
| 750.05 | 6,998 | | |
| 750.10 | 7,190 | | |
| 750.15 | 7,380 | | |
| 750.20 | 7,568 | | |
| 750.25 | 7,753 | | |
| 750.30 | 7,937 | | |
| 750.35 | 8,119 | | |
| 750.40 | 8,298 | | |
| 750.45 | 8,475 | | |
| 750.50 | 8,649 | | |

Proposed Conditions II

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Proposed Conditions - II
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Pond B-6: Bioretention B-6

Inflow Area = 2.980 ac, 86.58% Impervious, Inflow Depth = 4.80" for 100-yr event
Inflow = 21.46 cfs @ 11.96 hrs, Volume= 1.192 af
Outflow = 16.12 cfs @ 12.03 hrs, Volume= 1.097 af, Atten= 25%, Lag= 4.0 min
Primary = 6.50 cfs @ 12.03 hrs, Volume= 0.945 af
Secondary = 9.61 cfs @ 12.03 hrs, Volume= 0.152 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 762.45' @ 12.03 hrs Surf.Area= 9,763 sf Storage= 12,838 cf

Plug-Flow detention time= 93.0 min calculated for 1.097 af (92% of inflow)
Center-of-Mass det. time= 48.2 min (805.5 - 757.4)

| Volume | Invert | Avail.Storage | Storage Description |
|---------------------|----------------------|---------------------------|--|
| #1 | 761.00' | 18,440 cf | Surf. Storage (Prismatic) Listed below (Recalc) |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 761.00 | 8,000 | 0 | 0 |
| 763.00 | 10,440 | 18,440 | 18,440 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|--|
| #1 | Primary | 758.00' | 12.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 758.00' / 757.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf |
| #2 | Device 1 | 761.50' | 24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads |
| #3 | Secondary | 762.00' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=6.49 cfs @ 12.03 hrs HW=762.43' TW=0.00' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 6.49 cfs @ 8.27 fps)

↑**2=Grate** (Passes 6.49 cfs of 18.60 cfs potential flow)

Secondary OutFlow Max=9.24 cfs @ 12.03 hrs HW=762.43' TW=0.00' (Dynamic Tailwater)

↑**3=Sharp-Crested Rectangular Weir** (Weir Controls 9.24 cfs @ 2.15 fps)

Proposed Conditions II

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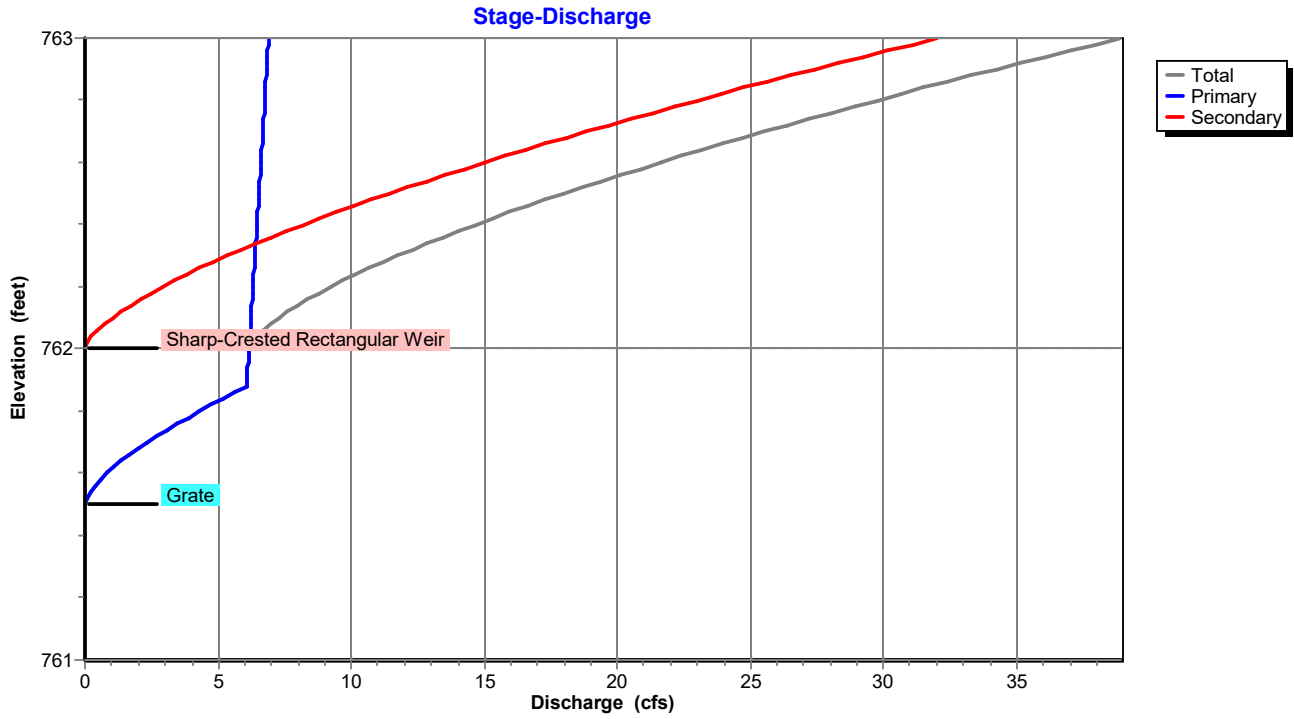
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Proposed Conditions - II
Type II 24-hr 100-yr Rainfall=5.27"

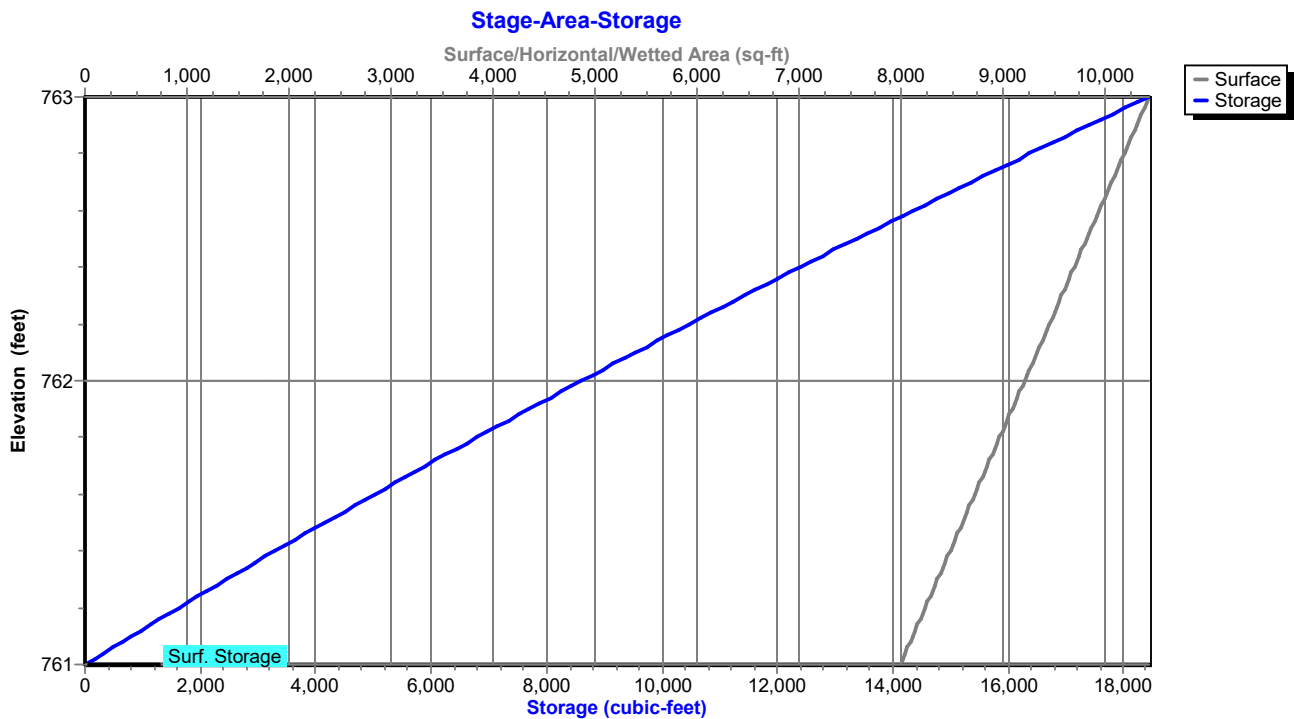
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Pond B-6: Bioretention B-6



Pond B-6: Bioretention B-6



Proposed Conditions II

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Proposed Conditions - II
Type II 24-hr 100-yr Rainfall=5.27"

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Stage-Discharge for Pond B-6: Bioretention B-6

| Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) | Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) |
|---------------------|--------------------|------------------|--------------------|---------------------|--------------------|------------------|--------------------|
| 761.00 | 0.00 | 0.00 | 0.00 | 762.02 | 6.28 | 6.18 | 0.09 |
| 761.02 | 0.00 | 0.00 | 0.00 | 762.04 | 6.46 | 6.20 | 0.26 |
| 761.04 | 0.00 | 0.00 | 0.00 | 762.06 | 6.70 | 6.22 | 0.48 |
| 761.06 | 0.00 | 0.00 | 0.00 | 762.08 | 6.97 | 6.23 | 0.74 |
| 761.08 | 0.00 | 0.00 | 0.00 | 762.10 | 7.28 | 6.25 | 1.03 |
| 761.10 | 0.00 | 0.00 | 0.00 | 762.12 | 7.62 | 6.26 | 1.36 |
| 761.12 | 0.00 | 0.00 | 0.00 | 762.14 | 7.98 | 6.28 | 1.71 |
| 761.14 | 0.00 | 0.00 | 0.00 | 762.16 | 8.38 | 6.29 | 2.09 |
| 761.16 | 0.00 | 0.00 | 0.00 | 762.18 | 8.79 | 6.31 | 2.49 |
| 761.18 | 0.00 | 0.00 | 0.00 | 762.20 | 9.23 | 6.32 | 2.91 |
| 761.20 | 0.00 | 0.00 | 0.00 | 762.22 | 9.70 | 6.34 | 3.36 |
| 761.22 | 0.00 | 0.00 | 0.00 | 762.24 | 10.18 | 6.35 | 3.83 |
| 761.24 | 0.00 | 0.00 | 0.00 | 762.26 | 10.68 | 6.37 | 4.31 |
| 761.26 | 0.00 | 0.00 | 0.00 | 762.28 | 11.20 | 6.38 | 4.82 |
| 761.28 | 0.00 | 0.00 | 0.00 | 762.30 | 11.74 | 6.40 | 5.34 |
| 761.30 | 0.00 | 0.00 | 0.00 | 762.32 | 12.29 | 6.41 | 5.88 |
| 761.32 | 0.00 | 0.00 | 0.00 | 762.34 | 12.86 | 6.43 | 6.44 |
| 761.34 | 0.00 | 0.00 | 0.00 | 762.36 | 13.45 | 6.44 | 7.01 |
| 761.36 | 0.00 | 0.00 | 0.00 | 762.38 | 14.06 | 6.46 | 7.60 |
| 761.38 | 0.00 | 0.00 | 0.00 | 762.40 | 14.68 | 6.47 | 8.21 |
| 761.40 | 0.00 | 0.00 | 0.00 | 762.42 | 15.31 | 6.48 | 8.83 |
| 761.42 | 0.00 | 0.00 | 0.00 | 762.44 | 15.96 | 6.50 | 9.46 |
| 761.44 | 0.00 | 0.00 | 0.00 | 762.46 | 16.62 | 6.51 | 10.11 |
| 761.46 | 0.00 | 0.00 | 0.00 | 762.48 | 17.30 | 6.53 | 10.77 |
| 761.48 | 0.00 | 0.00 | 0.00 | 762.50 | 17.99 | 6.54 | 11.45 |
| 761.50 | 0.00 | 0.00 | 0.00 | 762.52 | 18.69 | 6.56 | 12.13 |
| 761.52 | 0.07 | 0.07 | 0.00 | 762.54 | 19.41 | 6.57 | 12.84 |
| 761.54 | 0.21 | 0.21 | 0.00 | 762.56 | 20.14 | 6.59 | 13.55 |
| 761.56 | 0.38 | 0.38 | 0.00 | 762.58 | 20.88 | 6.60 | 14.28 |
| 761.58 | 0.59 | 0.59 | 0.00 | 762.60 | 21.63 | 6.62 | 15.02 |
| 761.60 | 0.83 | 0.83 | 0.00 | 762.62 | 22.40 | 6.63 | 15.77 |
| 761.62 | 1.09 | 1.09 | 0.00 | 762.64 | 23.17 | 6.64 | 16.53 |
| 761.64 | 1.37 | 1.37 | 0.00 | 762.66 | 23.96 | 6.66 | 17.30 |
| 761.66 | 1.67 | 1.67 | 0.00 | 762.68 | 24.76 | 6.67 | 18.09 |
| 761.68 | 2.00 | 2.00 | 0.00 | 762.70 | 25.57 | 6.69 | 18.88 |
| 761.70 | 2.34 | 2.34 | 0.00 | 762.72 | 26.39 | 6.70 | 19.69 |
| 761.72 | 2.70 | 2.70 | 0.00 | 762.74 | 27.22 | 6.72 | 20.51 |
| 761.74 | 3.08 | 3.08 | 0.00 | 762.76 | 28.07 | 6.73 | 21.34 |
| 761.76 | 3.47 | 3.47 | 0.00 | 762.78 | 28.92 | 6.74 | 22.17 |
| 761.78 | 3.88 | 3.88 | 0.00 | 762.80 | 29.78 | 6.76 | 23.02 |
| 761.80 | 4.30 | 4.30 | 0.00 | 762.82 | 30.65 | 6.77 | 23.88 |
| 761.82 | 4.74 | 4.74 | 0.00 | 762.84 | 31.54 | 6.79 | 24.75 |
| 761.84 | 5.19 | 5.19 | 0.00 | 762.86 | 32.43 | 6.80 | 25.63 |
| 761.86 | 5.65 | 5.65 | 0.00 | 762.88 | 33.33 | 6.81 | 26.52 |
| 761.88 | 6.08 | 6.08 | 0.00 | 762.90 | 34.25 | 6.83 | 27.42 |
| 761.90 | 6.09 | 6.09 | 0.00 | 762.92 | 35.17 | 6.84 | 28.32 |
| 761.92 | 6.11 | 6.11 | 0.00 | 762.94 | 36.10 | 6.86 | 29.24 |
| 761.94 | 6.12 | 6.12 | 0.00 | 762.96 | 37.04 | 6.87 | 30.17 |
| 761.96 | 6.14 | 6.14 | 0.00 | 762.98 | 37.99 | 6.88 | 31.10 |
| 761.98 | 6.15 | 6.15 | 0.00 | 763.00 | 38.94 | 6.90 | 32.05 |
| 762.00 | 6.17 | 6.17 | 0.00 | | | | |

Proposed Conditions II

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Proposed Conditions - II

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Stage-Area-Storage for Pond B-6: Bioretention B-6

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) | Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 761.00 | 8,000 | 0 | 762.02 | 9,244 | 8,795 |
| 761.02 | 8,024 | 160 | 762.04 | 9,269 | 8,980 |
| 761.04 | 8,049 | 321 | 762.06 | 9,293 | 9,165 |
| 761.06 | 8,073 | 482 | 762.08 | 9,318 | 9,352 |
| 761.08 | 8,098 | 644 | 762.10 | 9,342 | 9,538 |
| 761.10 | 8,122 | 806 | 762.12 | 9,366 | 9,725 |
| 761.12 | 8,146 | 969 | 762.14 | 9,391 | 9,913 |
| 761.14 | 8,171 | 1,132 | 762.16 | 9,415 | 10,101 |
| 761.16 | 8,195 | 1,296 | 762.18 | 9,440 | 10,289 |
| 761.18 | 8,220 | 1,460 | 762.20 | 9,464 | 10,478 |
| 761.20 | 8,244 | 1,624 | 762.22 | 9,488 | 10,668 |
| 761.22 | 8,268 | 1,790 | 762.24 | 9,513 | 10,858 |
| 761.24 | 8,293 | 1,955 | 762.26 | 9,537 | 11,048 |
| 761.26 | 8,317 | 2,121 | 762.28 | 9,562 | 11,239 |
| 761.28 | 8,342 | 2,288 | 762.30 | 9,586 | 11,431 |
| 761.30 | 8,366 | 2,455 | 762.32 | 9,610 | 11,623 |
| 761.32 | 8,390 | 2,622 | 762.34 | 9,635 | 11,815 |
| 761.34 | 8,415 | 2,791 | 762.36 | 9,659 | 12,008 |
| 761.36 | 8,439 | 2,959 | 762.38 | 9,684 | 12,202 |
| 761.38 | 8,464 | 3,128 | 762.40 | 9,708 | 12,396 |
| 761.40 | 8,488 | 3,298 | 762.42 | 9,732 | 12,590 |
| 761.42 | 8,512 | 3,468 | 762.44 | 9,757 | 12,785 |
| 761.44 | 8,537 | 3,638 | 762.46 | 9,781 | 12,980 |
| 761.46 | 8,561 | 3,809 | 762.48 | 9,806 | 13,176 |
| 761.48 | 8,586 | 3,981 | 762.50 | 9,830 | 13,373 |
| 761.50 | 8,610 | 4,153 | 762.52 | 9,854 | 13,569 |
| 761.52 | 8,634 | 4,325 | 762.54 | 9,879 | 13,767 |
| 761.54 | 8,659 | 4,498 | 762.56 | 9,903 | 13,964 |
| 761.56 | 8,683 | 4,671 | 762.58 | 9,928 | 14,163 |
| 761.58 | 8,708 | 4,845 | 762.60 | 9,952 | 14,362 |
| 761.60 | 8,732 | 5,020 | 762.62 | 9,976 | 14,561 |
| 761.62 | 8,756 | 5,194 | 762.64 | 10,001 | 14,761 |
| 761.64 | 8,781 | 5,370 | 762.66 | 10,025 | 14,961 |
| 761.66 | 8,805 | 5,546 | 762.68 | 10,050 | 15,162 |
| 761.68 | 8,830 | 5,722 | 762.70 | 10,074 | 15,363 |
| 761.70 | 8,854 | 5,899 | 762.72 | 10,098 | 15,565 |
| 761.72 | 8,878 | 6,076 | 762.74 | 10,123 | 15,767 |
| 761.74 | 8,903 | 6,254 | 762.76 | 10,147 | 15,970 |
| 761.76 | 8,927 | 6,432 | 762.78 | 10,172 | 16,173 |
| 761.78 | 8,952 | 6,611 | 762.80 | 10,196 | 16,376 |
| 761.80 | 8,976 | 6,790 | 762.82 | 10,220 | 16,581 |
| 761.82 | 9,000 | 6,970 | 762.84 | 10,245 | 16,785 |
| 761.84 | 9,025 | 7,150 | 762.86 | 10,269 | 16,990 |
| 761.86 | 9,049 | 7,331 | 762.88 | 10,294 | 17,196 |
| 761.88 | 9,074 | 7,512 | 762.90 | 10,318 | 17,402 |
| 761.90 | 9,098 | 7,694 | 762.92 | 10,342 | 17,609 |
| 761.92 | 9,122 | 7,876 | 762.94 | 10,367 | 17,816 |
| 761.94 | 9,147 | 8,059 | 762.96 | 10,391 | 18,023 |
| 761.96 | 9,171 | 8,242 | 762.98 | 10,416 | 18,231 |
| 761.98 | 9,196 | 8,426 | 763.00 | 10,440 | 18,440 |
| 762.00 | 9,220 | 8,610 | | | |

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Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Link 2AR: 2A Reach

Inflow Area = 43.007 ac, 86.82% Impervious, Inflow Depth = 4.77" for 100-yr event
Inflow = 204.68 cfs @ 12.11 hrs, Volume= 17.111 af
Primary = 202.12 cfs @ 12.23 hrs, Volume= 17.111 af, Atten= 1%, Lag= 6.9 min

Primary outflow = Inflow delayed by 6.9 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Link 2AT: DA 2A Total

Inflow Area = 43.007 ac, 86.82% Impervious, Inflow Depth = 4.77" for 100-yr event
Inflow = 204.68 cfs @ 12.11 hrs, Volume= 17.111 af
Primary = 204.68 cfs @ 12.11 hrs, Volume= 17.111 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Summary for Link 2BP: Bypass

Inflow Area = 17.418 ac, 99.32% Impervious, Inflow Depth > 5.03" for 100-yr event
Inflow = 127.13 cfs @ 11.96 hrs, Volume= 7.305 af
Primary = 70.00 cfs @ 11.85 hrs, Volume= 6.712 af, Atten= 45%, Lag= 0.0 min
Secondary = 57.13 cfs @ 11.96 hrs, Volume= 0.592 af

Primary outflow = Inflow below 70.00 cfs, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Summary for Link 2BR: 2BR

Inflow Area = 11.872 ac, 100.00% Impervious, Inflow Depth > 5.03" for 100-yr event
Inflow = 86.65 cfs @ 11.96 hrs, Volume= 4.979 af
Primary = 84.14 cfs @ 12.09 hrs, Volume= 4.979 af, Atten= 3%, Lag= 8.0 min

Primary outflow = Inflow delayed by 8.0 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Summary for Link 2DT: DA 2D Total

Inflow Area = 17.418 ac, 99.32% Impervious, Inflow Depth > 5.03" for 100-yr event
Inflow = 113.36 cfs @ 12.00 hrs, Volume= 7.304 af
Primary = 113.36 cfs @ 12.00 hrs, Volume= 7.304 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - II

Type II 24-hr 100-yr Rainfall=5.27"

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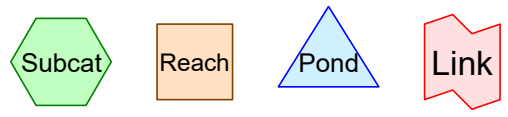
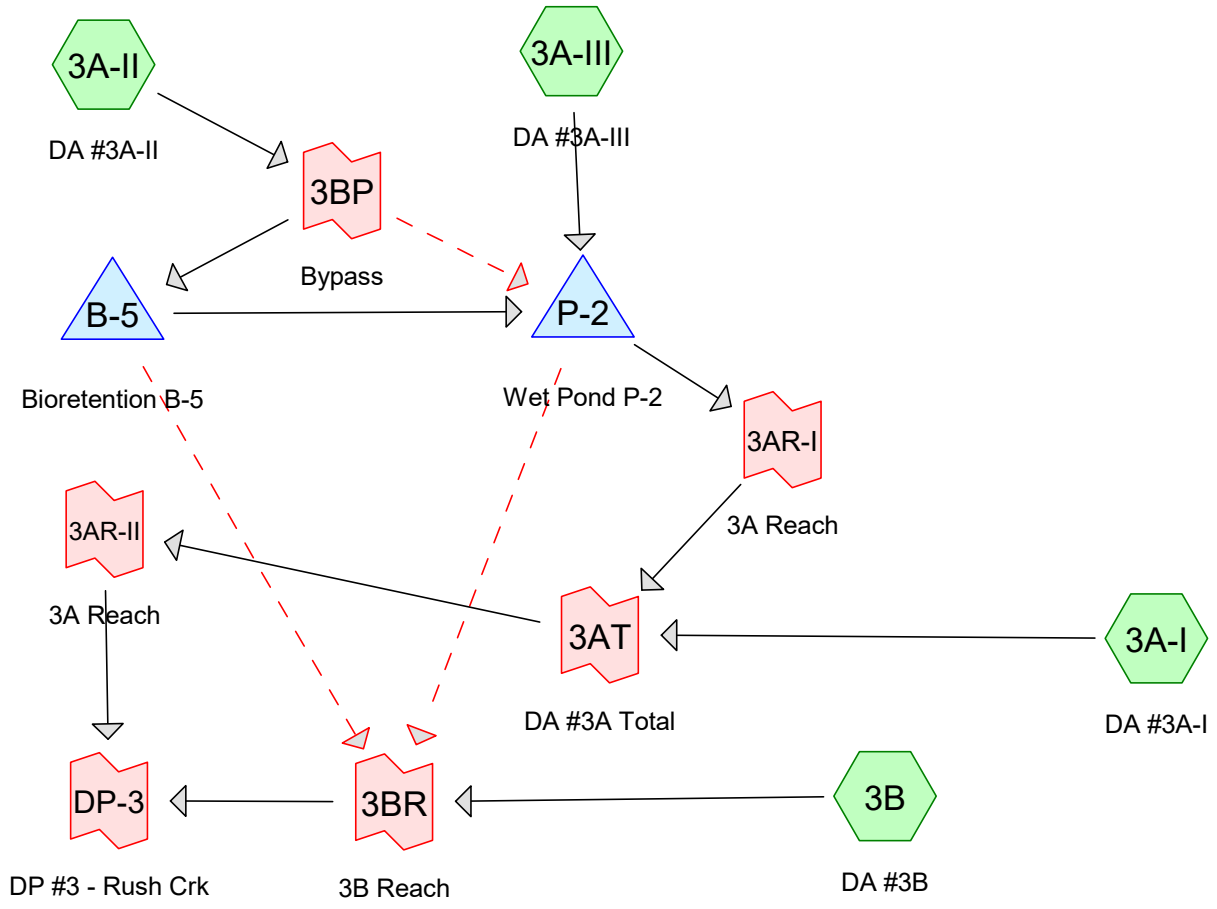
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Summary for Link DP-2: DP #2 - Smokes Crk

Inflow Area = 83.814 ac, 88.53% Impervious, Inflow Depth > 4.79" for 100-yr event
Inflow = 335.55 cfs @ 12.03 hrs, Volume= 33.468 af
Primary = 335.55 cfs @ 12.03 hrs, Volume= 33.468 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

Proposed Conditions - Report III of III, Drainage Area #3



Routing Diagram for Proposed Conditions III
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Proposed Conditions III

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Proposed Conditions - III
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Subcatchment 3A-I: DA #3A-I

Runoff = 17.20 cfs @ 12.37 hrs, Volume= 2.043 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 19.111 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 12.223 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 31.334 | 87 | Weighted Average |
| 19.111 | | 60.99% Pervious Area |
| 12.223 | | 39.01% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 31.4 | 150 | 0.0100 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 3.9 | 380 | 0.0100 | 1.61 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 1.2 | 146 | 0.0100 | 2.03 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.9 | 774 | | 4.50 | | Direct Entry, Pipe Flow |
| 39.4 | 1,450 | Total | | | |

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Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Subcatchment 3A-II: DA #3A-II

Runoff = 31.10 cfs @ 11.97 hrs, Volume= 1.553 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 3.345 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 11.593 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 14.938 | 94 | Weighted Average |
| 3.345 | | 22.39% Pervious Area |
| 11.593 | | 77.61% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.6 | 100 | 0.0150 | 1.02 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 0.7 | 100 | 0.0150 | 2.49 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.3 | 200 | | | | Total, Increased to minimum Tc = 6.0 min |

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Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Subcatchment 3A-III: DA #3A-III

Runoff = 2.33 cfs @ 11.98 hrs, Volume= 0.113 af, Depth= 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 1.918 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 0.384 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 2.302 | 83 | Weighted Average |
| 1.918 | | 83.32% Pervious Area |
| 0.384 | | 16.68% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|--|-------------------|----------------|--|
| 1.6 | 100 | 0.0150 | 1.02 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 3.9 | 860 | 0.0330 | 3.69 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 5.5 | 960 | Total, Increased to minimum Tc = 6.0 min | | | |

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Summary for Subcatchment 3B: DA #3B

Runoff = 4.91 cfs @ 12.15 hrs, Volume= 0.391 af, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-yr Rainfall=1.84"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 5.920 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 1.432 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.055 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 7.407 | 84 | Weighted Average |
| 5.975 | | 80.67% Pervious Area |
| 1.432 | | 19.33% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 19.3 | 100 | 0.0150 | 0.09 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 1.1 | 130 | 0.0150 | 1.97 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 20.4 | 230 | Total | | | |

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Proposed Conditions - III
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Pond B-5: Bioretention B-5

Inflow Area = 14.938 ac, 77.61% Impervious, Inflow Depth = 1.09" for 1-yr event
Inflow = 14.30 cfs @ 11.85 hrs, Volume= 1.357 af
Outflow = 11.43 cfs @ 12.08 hrs, Volume= 1.167 af, Atten= 20%, Lag= 13.9 min
Primary = 11.43 cfs @ 12.08 hrs, Volume= 1.167 af
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 741.58' @ 12.08 hrs Surf.Area= 18,352 sf Storage= 18,470 cf

Plug-Flow detention time= 128.4 min calculated for 1.167 af (86% of inflow)
Center-of-Mass det. time= 60.6 min (876.8 - 816.2)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|--|
| #1 | 740.50' | 46,838 cf | Surf. Storage (Prismatic) Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 740.50 | 15,980 | 0 | 0 |
| 743.00 | 21,490 | 46,838 | 46,838 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|--|
| #1 | Primary | 737.00' | 18.0" Round Culvert L= 170.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 737.00' / 736.00' S= 0.0059 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf |
| #2 | Device 1 | 741.00' | 24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads |
| #3 | Secondary | 742.50' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=11.31 cfs @ 12.08 hrs HW=741.57' TW=736.71' (Dynamic Tailwater)

↑**1=Culvert** (Passes 11.31 cfs of 14.05 cfs potential flow)

↑**2=Grate** (Weir Controls 11.31 cfs @ 2.47 fps)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=740.50' TW=0.00' (Dynamic Tailwater)

↑**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

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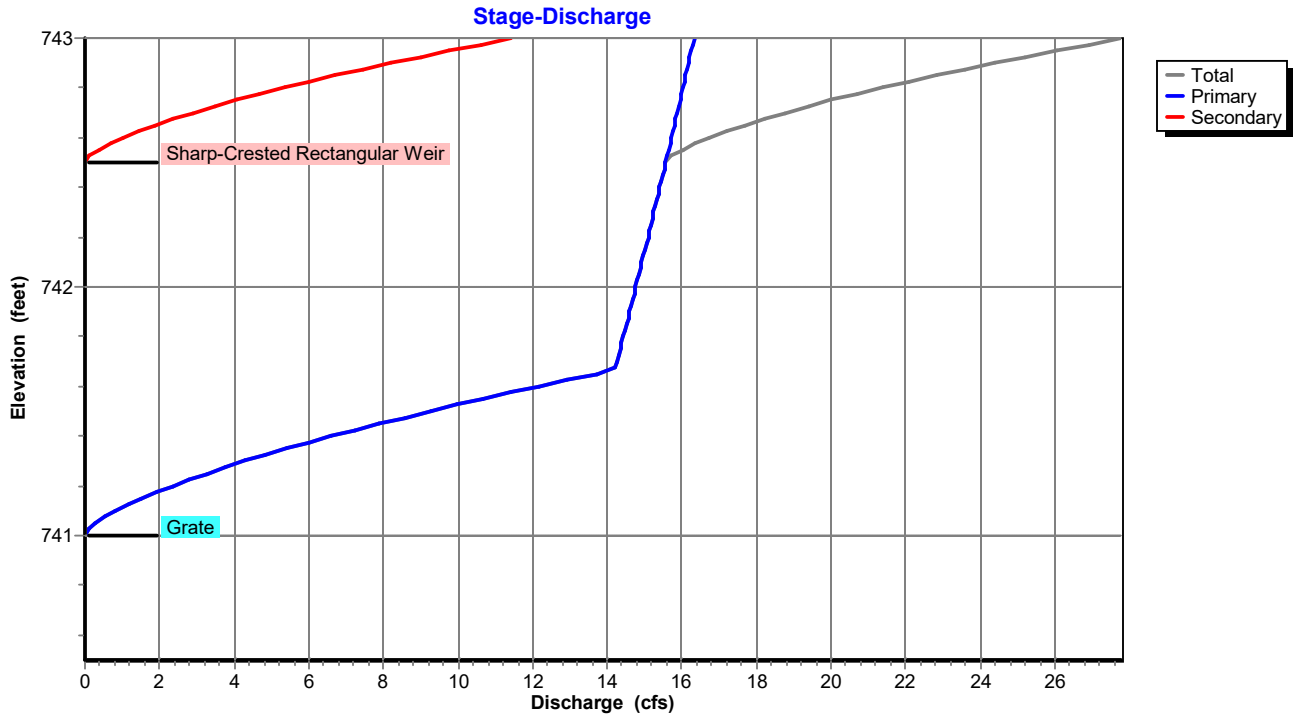
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Proposed Conditions - III
Type II 24-hr 1-yr Rainfall=1.84"

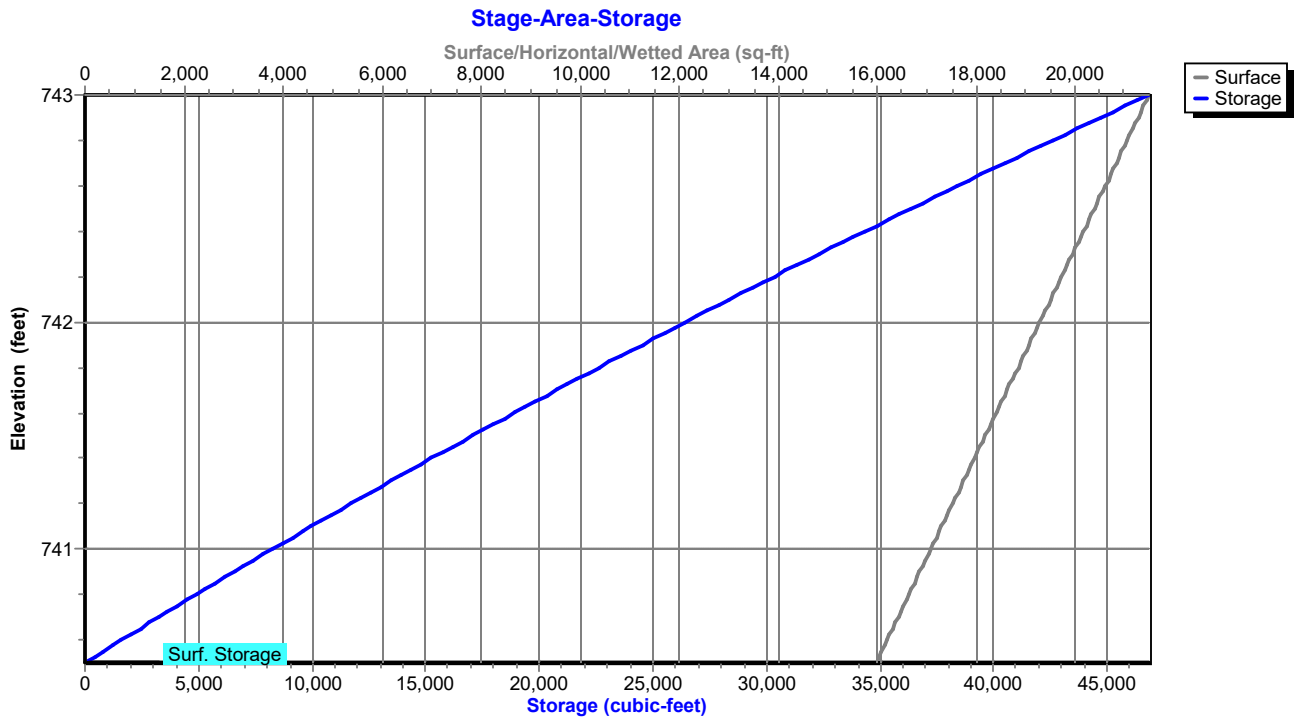
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Pond B-5: Bioretention B-5



Pond B-5: Bioretention B-5



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Stage-Discharge for Pond B-5: Bioretention B-5

| Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) |
|---------------------|--------------------|------------------|--------------------|
| 740.50 | 0.00 | 0.00 | 0.00 |
| 740.55 | 0.00 | 0.00 | 0.00 |
| 740.60 | 0.00 | 0.00 | 0.00 |
| 740.65 | 0.00 | 0.00 | 0.00 |
| 740.70 | 0.00 | 0.00 | 0.00 |
| 740.75 | 0.00 | 0.00 | 0.00 |
| 740.80 | 0.00 | 0.00 | 0.00 |
| 740.85 | 0.00 | 0.00 | 0.00 |
| 740.90 | 0.00 | 0.00 | 0.00 |
| 740.95 | 0.00 | 0.00 | 0.00 |
| 741.00 | 0.00 | 0.00 | 0.00 |
| 741.05 | 0.29 | 0.29 | 0.00 |
| 741.10 | 0.83 | 0.83 | 0.00 |
| 741.15 | 1.52 | 1.52 | 0.00 |
| 741.20 | 2.34 | 2.34 | 0.00 |
| 741.25 | 3.27 | 3.27 | 0.00 |
| 741.30 | 4.30 | 4.30 | 0.00 |
| 741.35 | 5.42 | 5.42 | 0.00 |
| 741.40 | 6.62 | 6.62 | 0.00 |
| 741.45 | 7.90 | 7.90 | 0.00 |
| 741.50 | 9.25 | 9.25 | 0.00 |
| 741.55 | 10.67 | 10.67 | 0.00 |
| 741.60 | 12.16 | 12.16 | 0.00 |
| 741.65 | 13.71 | 13.71 | 0.00 |
| 741.70 | 14.27 | 14.27 | 0.00 |
| 741.75 | 14.35 | 14.35 | 0.00 |
| 741.80 | 14.44 | 14.44 | 0.00 |
| 741.85 | 14.52 | 14.52 | 0.00 |
| 741.90 | 14.60 | 14.60 | 0.00 |
| 741.95 | 14.69 | 14.69 | 0.00 |
| 742.00 | 14.77 | 14.77 | 0.00 |
| 742.05 | 14.85 | 14.85 | 0.00 |
| 742.10 | 14.93 | 14.93 | 0.00 |
| 742.15 | 15.01 | 15.01 | 0.00 |
| 742.20 | 15.09 | 15.09 | 0.00 |
| 742.25 | 15.17 | 15.17 | 0.00 |
| 742.30 | 15.25 | 15.25 | 0.00 |
| 742.35 | 15.33 | 15.33 | 0.00 |
| 742.40 | 15.41 | 15.41 | 0.00 |
| 742.45 | 15.49 | 15.49 | 0.00 |
| 742.50 | 15.57 | 15.57 | 0.00 |
| 742.55 | 16.01 | 15.65 | 0.37 |
| 742.60 | 16.75 | 15.72 | 1.03 |
| 742.65 | 17.69 | 15.80 | 1.89 |
| 742.70 | 18.79 | 15.88 | 2.91 |
| 742.75 | 20.02 | 15.95 | 4.07 |
| 742.80 | 21.37 | 16.03 | 5.34 |
| 742.85 | 22.83 | 16.10 | 6.72 |
| 742.90 | 24.38 | 16.18 | 8.21 |
| 742.95 | 26.04 | 16.25 | 9.78 |
| 743.00 | 27.77 | 16.33 | 11.45 |

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Stage-Area-Storage for Pond B-5: Bioretention B-5

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|
| 740.50 | 15,980 | 0 |
| 740.55 | 16,090 | 802 |
| 740.60 | 16,200 | 1,609 |
| 740.65 | 16,311 | 2,422 |
| 740.70 | 16,421 | 3,240 |
| 740.75 | 16,531 | 4,064 |
| 740.80 | 16,641 | 4,893 |
| 740.85 | 16,751 | 5,728 |
| 740.90 | 16,862 | 6,568 |
| 740.95 | 16,972 | 7,414 |
| 741.00 | 17,082 | 8,266 |
| 741.05 | 17,192 | 9,122 |
| 741.10 | 17,302 | 9,985 |
| 741.15 | 17,413 | 10,853 |
| 741.20 | 17,523 | 11,726 |
| 741.25 | 17,633 | 12,605 |
| 741.30 | 17,743 | 13,489 |
| 741.35 | 17,853 | 14,379 |
| 741.40 | 17,964 | 15,275 |
| 741.45 | 18,074 | 16,176 |
| 741.50 | 18,184 | 17,082 |
| 741.55 | 18,294 | 17,994 |
| 741.60 | 18,404 | 18,911 |
| 741.65 | 18,515 | 19,834 |
| 741.70 | 18,625 | 20,763 |
| 741.75 | 18,735 | 21,697 |
| 741.80 | 18,845 | 22,636 |
| 741.85 | 18,955 | 23,581 |
| 741.90 | 19,066 | 24,532 |
| 741.95 | 19,176 | 25,488 |
| 742.00 | 19,286 | 26,450 |
| 742.05 | 19,396 | 27,417 |
| 742.10 | 19,506 | 28,389 |
| 742.15 | 19,617 | 29,367 |
| 742.20 | 19,727 | 30,351 |
| 742.25 | 19,837 | 31,340 |
| 742.30 | 19,947 | 32,334 |
| 742.35 | 20,057 | 33,335 |
| 742.40 | 20,168 | 34,340 |
| 742.45 | 20,278 | 35,351 |
| 742.50 | 20,388 | 36,368 |
| 742.55 | 20,498 | 37,390 |
| 742.60 | 20,608 | 38,418 |
| 742.65 | 20,719 | 39,451 |
| 742.70 | 20,829 | 40,490 |
| 742.75 | 20,939 | 41,534 |
| 742.80 | 21,049 | 42,584 |
| 742.85 | 21,159 | 43,639 |
| 742.90 | 21,270 | 44,700 |
| 742.95 | 21,380 | 45,766 |
| 743.00 | 21,490 | 46,838 |

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Summary for Pond P-2: Wet Pond P-2

Inflow Area = 17.240 ac, 69.47% Impervious, Inflow Depth = 1.03" for 1-yr event
 Inflow = 28.72 cfs @ 11.98 hrs, Volume= 1.476 af
 Outflow = 0.40 cfs @ 20.03 hrs, Volume= 1.384 af, Atten= 99%, Lag= 483.1 min
 Primary = 0.40 cfs @ 20.03 hrs, Volume= 1.384 af
 Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Peak Elev= 737.64' @ 20.03 hrs Surf.Area= 50,985 sf Storage= 47,253 cf

Plug-Flow detention time= 1,378.2 min calculated for 1.384 af (94% of inflow)
 Center-of-Mass det. time= 1,341.8 min (2,196.2 - 854.3)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|--|
| #1 | 730.00' | 0 cf | Retention (Irregular) Listed below (Recalc) 46,278 cf Overall x 0.0% Voids |
| #2 | 736.00' | 177,873 cf | Detention (Irregular) Listed below (Recalc) |
| | | 177,873 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|------------------|-------------------|---------------|------------------------|------------------------|------------------|
| 730.00 | 3,490 | 498.0 | 0 | 0 | 3,490 |
| 734.50 | 8,488 | 612.0 | 26,131 | 26,131 | 13,865 |
| 736.00 | 19,080 | 800.0 | 20,147 | 46,278 | 35,016 |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|------------------|-------------------|---------------|------------------------|------------------------|------------------|
| 736.00 | 25,870 | 957.0 | 0 | 0 | 25,870 |
| 741.00 | 46,260 | 1,082.0 | 177,873 | 177,873 | 46,783 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|--|
| #1 | Primary | 736.00' | 24.0" Round Culvert L= 220.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 736.00' / 735.17' S= 0.0038 '/ Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf |
| #2 | Device 1 | 738.75' | 24.0" W x 24.0" H 9° Grate C= 0.600 Limited to weir flow at low heads |
| #3 | Secondary | 740.00' | 20.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |
| #4 | Device 1 | 736.00' | 4.0" Round Culvert-Low Flow L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 735.00' / 736.00' S= -0.0667 '/ Cc= 0.900 n= 0.012, Flow Area= 0.09 sf |
| #5 | Device 1 | 737.65' | 18.0" W x 6.0" H Vert. Orifice-High C= 0.600 Limited to weir flow at low heads |

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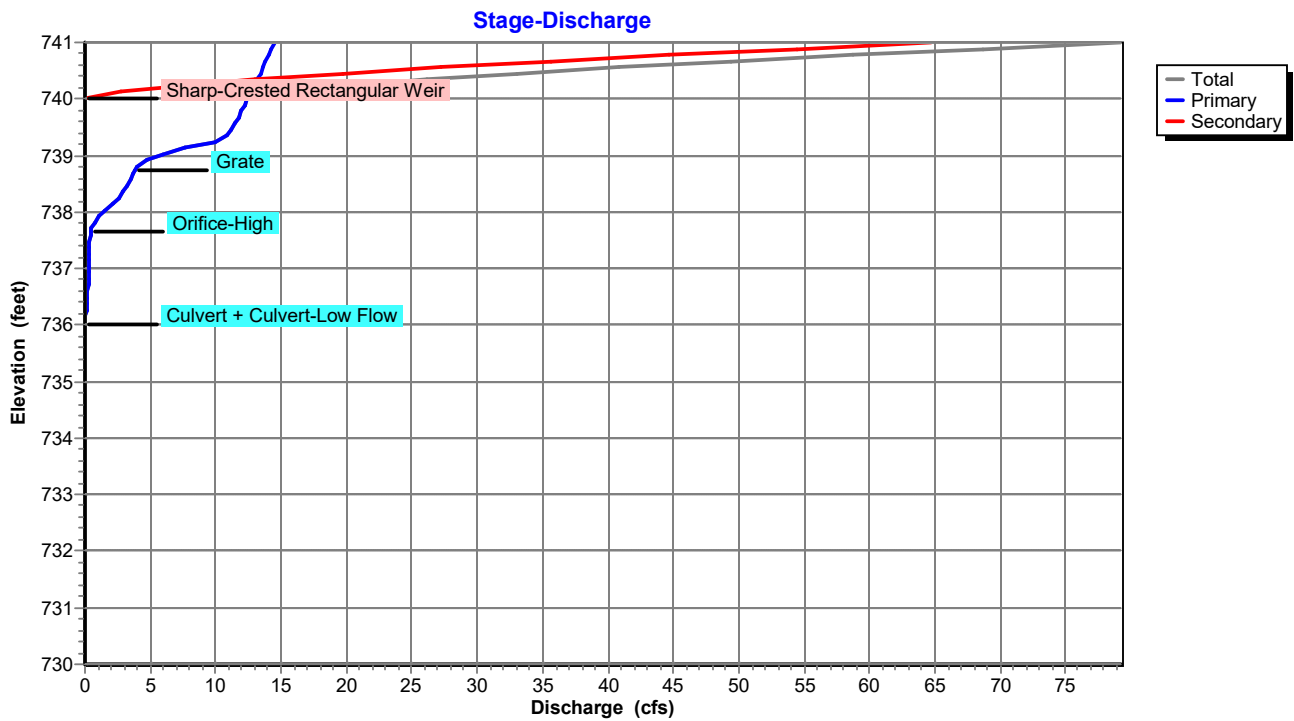
Primary OutFlow Max=0.40 cfs @ 20.03 hrs HW=737.64' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 0.40 cfs of 5.67 cfs potential flow)
- 2=Gate (Controls 0.00 cfs)
- 4=Culvert-Low Flow (Inlet Controls 0.40 cfs @ 4.61 fps)
- 5=Orifice-High (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=730.00' TW=0.00' (Dynamic Tailwater)

- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond P-2: Wet Pond P-2



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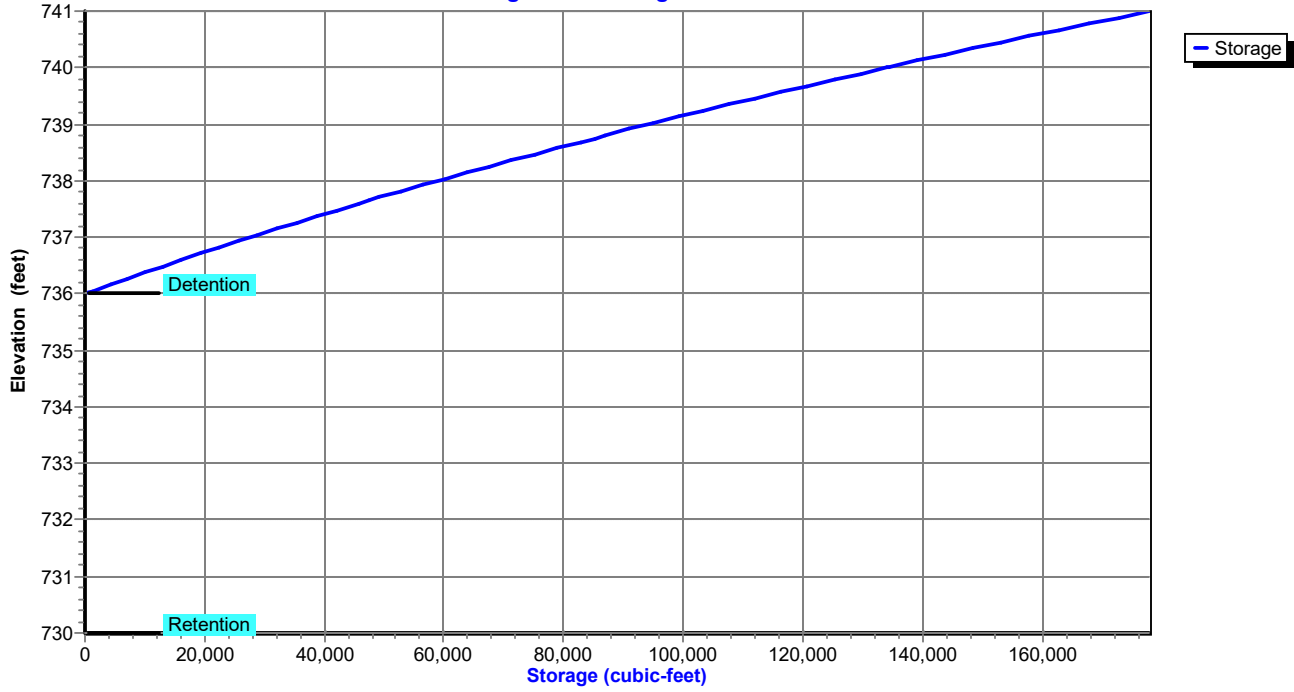
Proposed Conditions - III
Type II 24-hr 1-yr Rainfall=1.84"

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Pond P-2: Wet Pond P-2

Stage-Area-Storage



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 Type II 24-hr 1-yr Rainfall=1.84"

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Stage-Discharge for Pond P-2: Wet Pond P-2

| Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) | Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) |
|---------------------|--------------------|------------------|--------------------|---------------------|--------------------|------------------|--------------------|
| 730.00 | 0.00 | 0.00 | 0.00 | 737.65 | 0.40 | 0.40 | 0.00 |
| 730.15 | 0.00 | 0.00 | 0.00 | 737.80 | 0.70 | 0.70 | 0.00 |
| 730.30 | 0.00 | 0.00 | 0.00 | 737.95 | 1.23 | 1.23 | 0.00 |
| 730.45 | 0.00 | 0.00 | 0.00 | 738.10 | 1.91 | 1.91 | 0.00 |
| 730.60 | 0.00 | 0.00 | 0.00 | 738.25 | 2.56 | 2.56 | 0.00 |
| 730.75 | 0.00 | 0.00 | 0.00 | 738.40 | 3.02 | 3.02 | 0.00 |
| 730.90 | 0.00 | 0.00 | 0.00 | 738.55 | 3.41 | 3.41 | 0.00 |
| 731.05 | 0.00 | 0.00 | 0.00 | 738.70 | 3.74 | 3.74 | 0.00 |
| 731.20 | 0.00 | 0.00 | 0.00 | 738.85 | 4.31 | 4.31 | 0.00 |
| 731.35 | 0.00 | 0.00 | 0.00 | 739.00 | 5.65 | 5.65 | 0.00 |
| 731.50 | 0.00 | 0.00 | 0.00 | 739.15 | 8.00 | 8.00 | 0.00 |
| 731.65 | 0.00 | 0.00 | 0.00 | 739.30 | 10.78 | 10.78 | 0.00 |
| 731.80 | 0.00 | 0.00 | 0.00 | 739.45 | 11.16 | 11.16 | 0.00 |
| 731.95 | 0.00 | 0.00 | 0.00 | 739.60 | 11.52 | 11.52 | 0.00 |
| 732.10 | 0.00 | 0.00 | 0.00 | 739.75 | 11.87 | 11.87 | 0.00 |
| 732.25 | 0.00 | 0.00 | 0.00 | 739.90 | 12.21 | 12.21 | 0.00 |
| 732.40 | 0.00 | 0.00 | 0.00 | 740.05 | 13.27 | 12.54 | 0.73 |
| 732.55 | 0.00 | 0.00 | 0.00 | 740.20 | 18.70 | 12.86 | 5.84 |
| 732.70 | 0.00 | 0.00 | 0.00 | 740.35 | 26.67 | 13.18 | 13.49 |
| 732.85 | 0.00 | 0.00 | 0.00 | 740.50 | 36.49 | 13.48 | 23.01 |
| 733.00 | 0.00 | 0.00 | 0.00 | 740.65 | 47.83 | 13.78 | 34.05 |
| 733.15 | 0.00 | 0.00 | 0.00 | 740.80 | 60.50 | 14.08 | 46.42 |
| 733.30 | 0.00 | 0.00 | 0.00 | 740.95 | 74.35 | 14.37 | 59.98 |
| 733.45 | 0.00 | 0.00 | 0.00 | | | | |
| 733.60 | 0.00 | 0.00 | 0.00 | | | | |
| 733.75 | 0.00 | 0.00 | 0.00 | | | | |
| 733.90 | 0.00 | 0.00 | 0.00 | | | | |
| 734.05 | 0.00 | 0.00 | 0.00 | | | | |
| 734.20 | 0.00 | 0.00 | 0.00 | | | | |
| 734.35 | 0.00 | 0.00 | 0.00 | | | | |
| 734.50 | 0.00 | 0.00 | 0.00 | | | | |
| 734.65 | 0.00 | 0.00 | 0.00 | | | | |
| 734.80 | 0.00 | 0.00 | 0.00 | | | | |
| 734.95 | 0.00 | 0.00 | 0.00 | | | | |
| 735.10 | 0.00 | 0.00 | 0.00 | | | | |
| 735.25 | 0.00 | 0.00 | 0.00 | | | | |
| 735.40 | 0.00 | 0.00 | 0.00 | | | | |
| 735.55 | 0.00 | 0.00 | 0.00 | | | | |
| 735.70 | 0.00 | 0.00 | 0.00 | | | | |
| 735.85 | 0.00 | 0.00 | 0.00 | | | | |
| 736.00 | 0.00 | 0.00 | 0.00 | | | | |
| 736.15 | 0.04 | 0.04 | 0.00 | | | | |
| 736.30 | 0.12 | 0.12 | 0.00 | | | | |
| 736.45 | 0.18 | 0.18 | 0.00 | | | | |
| 736.60 | 0.22 | 0.22 | 0.00 | | | | |
| 736.75 | 0.25 | 0.25 | 0.00 | | | | |
| 736.90 | 0.28 | 0.28 | 0.00 | | | | |
| 737.05 | 0.31 | 0.31 | 0.00 | | | | |
| 737.20 | 0.34 | 0.34 | 0.00 | | | | |
| 737.35 | 0.36 | 0.36 | 0.00 | | | | |
| 737.50 | 0.38 | 0.38 | 0.00 | | | | |

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Proposed Conditions - III
Type II 24-hr 1-yr Rainfall=1.84"

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Stage-Area-Storage for Pond P-2: Wet Pond P-2

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---------------------|-------------------------|---------------------|-------------------------|
| 730.00 | 0 | 737.65 | 47,612 |
| 730.15 | 0 | 737.80 | 52,448 |
| 730.30 | 0 | 737.95 | 57,372 |
| 730.45 | 0 | 738.10 | 62,385 |
| 730.60 | 0 | 738.25 | 67,487 |
| 730.75 | 0 | 738.40 | 72,680 |
| 730.90 | 0 | 738.55 | 77,965 |
| 731.05 | 0 | 738.70 | 83,341 |
| 731.20 | 0 | 738.85 | 88,810 |
| 731.35 | 0 | 739.00 | 94,372 |
| 731.50 | 0 | 739.15 | 100,029 |
| 731.65 | 0 | 739.30 | 105,782 |
| 731.80 | 0 | 739.45 | 111,630 |
| 731.95 | 0 | 739.60 | 117,575 |
| 732.10 | 0 | 739.75 | 123,617 |
| 732.25 | 0 | 739.90 | 129,758 |
| 732.40 | 0 | 740.05 | 135,998 |
| 732.55 | 0 | 740.20 | 142,339 |
| 732.70 | 0 | 740.35 | 148,779 |
| 732.85 | 0 | 740.50 | 155,322 |
| 733.00 | 0 | 740.65 | 161,967 |
| 733.15 | 0 | 740.80 | 168,714 |
| 733.30 | 0 | 740.95 | 175,566 |
| 733.45 | 0 | | |
| 733.60 | 0 | | |
| 733.75 | 0 | | |
| 733.90 | 0 | | |
| 734.05 | 0 | | |
| 734.20 | 0 | | |
| 734.35 | 0 | | |
| 734.50 | 0 | | |
| 734.65 | 0 | | |
| 734.80 | 0 | | |
| 734.95 | 0 | | |
| 735.10 | 0 | | |
| 735.25 | 0 | | |
| 735.40 | 0 | | |
| 735.55 | 0 | | |
| 735.70 | 0 | | |
| 735.85 | 0 | | |
| 736.00 | 0 | | |
| 736.15 | 3,920 | | |
| 736.30 | 7,919 | | |
| 736.45 | 11,998 | | |
| 736.60 | 16,159 | | |
| 736.75 | 20,401 | | |
| 736.90 | 24,725 | | |
| 737.05 | 29,133 | | |
| 737.20 | 33,624 | | |
| 737.35 | 38,201 | | |
| 737.50 | 42,863 | | |

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Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link 3AR-I: 3A Reach

Inflow Area = 17.240 ac, 69.47% Impervious, Inflow Depth > 0.96" for 1-yr event
Inflow = 0.40 cfs @ 20.03 hrs, Volume= 1.384 af
Primary = 0.40 cfs @ 20.09 hrs, Volume= 1.384 af, Atten= 0%, Lag= 3.6 min

Primary outflow = Inflow delayed by 3.6 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link 3AR-II: 3A Reach

Inflow Area = 48.574 ac, 49.82% Impervious, Inflow Depth > 0.85" for 1-yr event
Inflow = 17.50 cfs @ 12.38 hrs, Volume= 3.427 af
Primary = 17.43 cfs @ 12.40 hrs, Volume= 3.427 af, Atten= 0%, Lag= 1.6 min

Primary outflow = Inflow delayed by 1.6 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - III
Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link 3AT: DA #3A Total

Inflow Area = 48.574 ac, 49.82% Impervious, Inflow Depth > 0.85" for 1-yr event
Inflow = 17.50 cfs @ 12.38 hrs, Volume= 3.427 af
Primary = 17.50 cfs @ 12.38 hrs, Volume= 3.427 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link 3BP: Bypass

Inflow Area = 14.938 ac, 77.61% Impervious, Inflow Depth = 1.25" for 1-yr event
Inflow = 31.10 cfs @ 11.97 hrs, Volume= 1.553 af
Primary = 14.30 cfs @ 11.85 hrs, Volume= 1.357 af, Atten= 54%, Lag= 0.0 min
Secondary = 16.80 cfs @ 11.97 hrs, Volume= 0.196 af

Primary outflow = Inflow below 14.30 cfs, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link 3BR: 3B Reach

Inflow Area = 7.407 ac, 19.33% Impervious, Inflow Depth = 0.63" for 1-yr event
Inflow = 4.91 cfs @ 12.15 hrs, Volume= 0.391 af
Primary = 4.87 cfs @ 12.29 hrs, Volume= 0.391 af, Atten= 1%, Lag= 8.6 min

Primary outflow = Inflow delayed by 8.5 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 1-yr Rainfall=1.84"

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Summary for Link DP-3: DP #3 - Rush Crk

Inflow Area = 55.981 ac, 45.79% Impervious, Inflow Depth > 0.82" for 1-yr event
Inflow = 21.61 cfs @ 12.36 hrs, Volume= 3.817 af
Primary = 21.61 cfs @ 12.36 hrs, Volume= 3.817 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - III

Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Subcatchment 3A-I: DA #3A-I

Runoff = 42.27 cfs @ 12.36 hrs, Volume= 4.885 af, Depth= 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 19.111 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 12.223 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 31.334 | 87 | Weighted Average |
| 19.111 | | 60.99% Pervious Area |
| 12.223 | | 39.01% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 31.4 | 150 | 0.0100 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 3.9 | 380 | 0.0100 | 1.61 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 1.2 | 146 | 0.0100 | 2.03 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.9 | 774 | | 4.50 | | Direct Entry, Pipe Flow |
| 39.4 | 1,450 | Total | | | |

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Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Subcatchment 3A-II: DA #3A-II

Runoff = 59.75 cfs @ 11.96 hrs, Volume= 3.106 af, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 3.345 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 11.593 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 14.938 | 94 | Weighted Average |
| 3.345 | | 22.39% Pervious Area |
| 11.593 | | 77.61% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.6 | 100 | 0.0150 | 1.02 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 0.7 | 100 | 0.0150 | 2.49 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.3 | 200 | | | | Total, Increased to minimum Tc = 6.0 min |

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Summary for Subcatchment 3A-III: DA #3A-III

Runoff = 6.22 cfs @ 11.97 hrs, Volume= 0.301 af, Depth= 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 1.918 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 0.384 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 2.302 | 83 | Weighted Average |
| 1.918 | | 83.32% Pervious Area |
| 0.384 | | 16.68% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|--|-------------------|----------------|--|
| 1.6 | 100 | 0.0150 | 1.02 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 3.9 | 860 | 0.0330 | 3.69 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 5.5 | 960 | Total, Increased to minimum Tc = 6.0 min | | | |

Proposed Conditions III

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Proposed Conditions - III
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Subcatchment 3B: DA #3B

Runoff = 13.28 cfs @ 12.13 hrs, Volume= 1.013 af, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.15"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 5.920 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 1.432 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.055 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 7.407 | 84 | Weighted Average |
| 5.975 | | 80.67% Pervious Area |
| 1.432 | | 19.33% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 19.3 | 100 | 0.0150 | 0.09 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 1.1 | 130 | 0.0150 | 1.97 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 20.4 | 230 | Total | | | |

Proposed Conditions III

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Proposed Conditions - III
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Pond B-5: Bioretention B-5

Inflow Area = 14.938 ac, 77.61% Impervious, Inflow Depth = 1.90" for 10-yr event
Inflow = 14.30 cfs @ 11.70 hrs, Volume= 2.369 af
Outflow = 13.28 cfs @ 12.08 hrs, Volume= 2.179 af, Atten= 7%, Lag= 22.9 min
Primary = 13.28 cfs @ 12.08 hrs, Volume= 2.179 af
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 741.65' @ 12.11 hrs Surf.Area= 18,504 sf Storage= 19,743 cf

Plug-Flow detention time= 98.8 min calculated for 2.179 af (92% of inflow)
Center-of-Mass det. time= 53.5 min (859.0 - 805.5)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|--|
| #1 | 740.50' | 46,838 cf | Surf. Storage (Prismatic) Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 740.50 | 15,980 | 0 | 0 |
| 743.00 | 21,490 | 46,838 | 46,838 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|--|
| #1 | Primary | 737.00' | 18.0" Round Culvert L= 170.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 737.00' / 736.00' S= 0.0059 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf |
| #2 | Device 1 | 741.00' | 24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads |
| #3 | Secondary | 742.50' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=13.09 cfs @ 12.08 hrs HW=741.64' TW=738.10' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 13.09 cfs @ 7.41 fps)

↑**2=Grate** (Passes 13.09 cfs of 13.42 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=740.50' TW=0.00' (Dynamic Tailwater)

↑**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Proposed Conditions III

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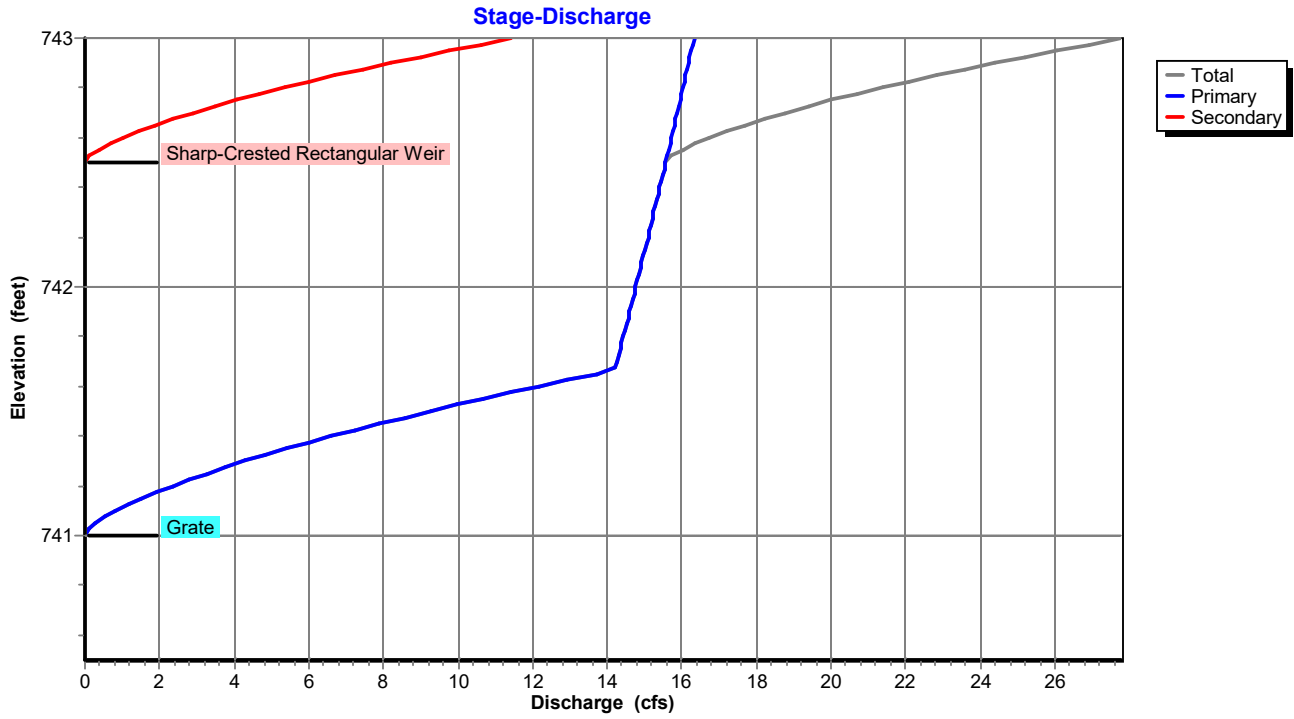
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Proposed Conditions - III
Type II 24-hr 10-yr Rainfall=3.15"

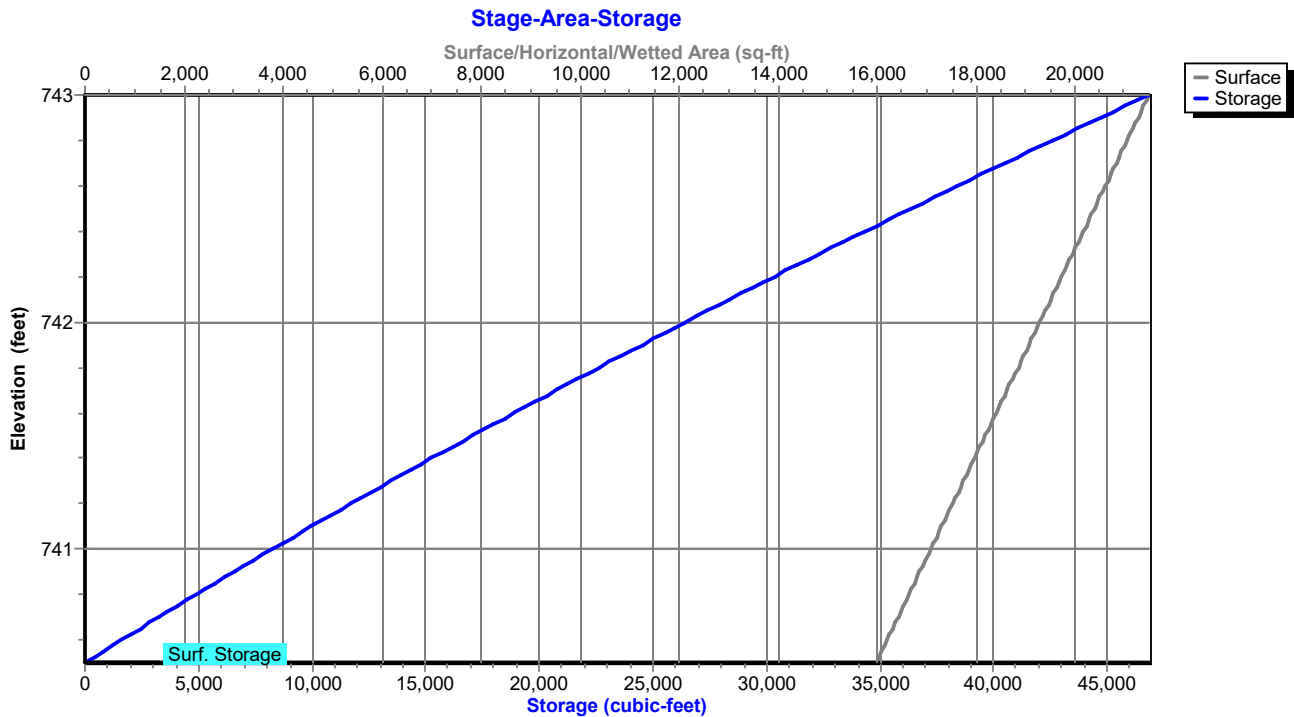
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Pond B-5: Bioretention B-5



Pond B-5: Bioretention B-5



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Proposed Conditions - III
Type II 24-hr 10-yr Rainfall=3.15"

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Stage-Discharge for Pond B-5: Bioretention B-5

| Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) |
|---------------------|--------------------|------------------|--------------------|
| 740.50 | 0.00 | 0.00 | 0.00 |
| 740.55 | 0.00 | 0.00 | 0.00 |
| 740.60 | 0.00 | 0.00 | 0.00 |
| 740.65 | 0.00 | 0.00 | 0.00 |
| 740.70 | 0.00 | 0.00 | 0.00 |
| 740.75 | 0.00 | 0.00 | 0.00 |
| 740.80 | 0.00 | 0.00 | 0.00 |
| 740.85 | 0.00 | 0.00 | 0.00 |
| 740.90 | 0.00 | 0.00 | 0.00 |
| 740.95 | 0.00 | 0.00 | 0.00 |
| 741.00 | 0.00 | 0.00 | 0.00 |
| 741.05 | 0.29 | 0.29 | 0.00 |
| 741.10 | 0.83 | 0.83 | 0.00 |
| 741.15 | 1.52 | 1.52 | 0.00 |
| 741.20 | 2.34 | 2.34 | 0.00 |
| 741.25 | 3.27 | 3.27 | 0.00 |
| 741.30 | 4.30 | 4.30 | 0.00 |
| 741.35 | 5.42 | 5.42 | 0.00 |
| 741.40 | 6.62 | 6.62 | 0.00 |
| 741.45 | 7.90 | 7.90 | 0.00 |
| 741.50 | 9.25 | 9.25 | 0.00 |
| 741.55 | 10.67 | 10.67 | 0.00 |
| 741.60 | 12.16 | 12.16 | 0.00 |
| 741.65 | 13.71 | 13.71 | 0.00 |
| 741.70 | 14.27 | 14.27 | 0.00 |
| 741.75 | 14.35 | 14.35 | 0.00 |
| 741.80 | 14.44 | 14.44 | 0.00 |
| 741.85 | 14.52 | 14.52 | 0.00 |
| 741.90 | 14.60 | 14.60 | 0.00 |
| 741.95 | 14.69 | 14.69 | 0.00 |
| 742.00 | 14.77 | 14.77 | 0.00 |
| 742.05 | 14.85 | 14.85 | 0.00 |
| 742.10 | 14.93 | 14.93 | 0.00 |
| 742.15 | 15.01 | 15.01 | 0.00 |
| 742.20 | 15.09 | 15.09 | 0.00 |
| 742.25 | 15.17 | 15.17 | 0.00 |
| 742.30 | 15.25 | 15.25 | 0.00 |
| 742.35 | 15.33 | 15.33 | 0.00 |
| 742.40 | 15.41 | 15.41 | 0.00 |
| 742.45 | 15.49 | 15.49 | 0.00 |
| 742.50 | 15.57 | 15.57 | 0.00 |
| 742.55 | 16.01 | 15.65 | 0.37 |
| 742.60 | 16.75 | 15.72 | 1.03 |
| 742.65 | 17.69 | 15.80 | 1.89 |
| 742.70 | 18.79 | 15.88 | 2.91 |
| 742.75 | 20.02 | 15.95 | 4.07 |
| 742.80 | 21.37 | 16.03 | 5.34 |
| 742.85 | 22.83 | 16.10 | 6.72 |
| 742.90 | 24.38 | 16.18 | 8.21 |
| 742.95 | 26.04 | 16.25 | 9.78 |
| 743.00 | 27.77 | 16.33 | 11.45 |

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Type II 24-hr 10-yr Rainfall=3.15"

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Stage-Area-Storage for Pond B-5: Bioretention B-5

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|
| 740.50 | 15,980 | 0 |
| 740.55 | 16,090 | 802 |
| 740.60 | 16,200 | 1,609 |
| 740.65 | 16,311 | 2,422 |
| 740.70 | 16,421 | 3,240 |
| 740.75 | 16,531 | 4,064 |
| 740.80 | 16,641 | 4,893 |
| 740.85 | 16,751 | 5,728 |
| 740.90 | 16,862 | 6,568 |
| 740.95 | 16,972 | 7,414 |
| 741.00 | 17,082 | 8,266 |
| 741.05 | 17,192 | 9,122 |
| 741.10 | 17,302 | 9,985 |
| 741.15 | 17,413 | 10,853 |
| 741.20 | 17,523 | 11,726 |
| 741.25 | 17,633 | 12,605 |
| 741.30 | 17,743 | 13,489 |
| 741.35 | 17,853 | 14,379 |
| 741.40 | 17,964 | 15,275 |
| 741.45 | 18,074 | 16,176 |
| 741.50 | 18,184 | 17,082 |
| 741.55 | 18,294 | 17,994 |
| 741.60 | 18,404 | 18,911 |
| 741.65 | 18,515 | 19,834 |
| 741.70 | 18,625 | 20,763 |
| 741.75 | 18,735 | 21,697 |
| 741.80 | 18,845 | 22,636 |
| 741.85 | 18,955 | 23,581 |
| 741.90 | 19,066 | 24,532 |
| 741.95 | 19,176 | 25,488 |
| 742.00 | 19,286 | 26,450 |
| 742.05 | 19,396 | 27,417 |
| 742.10 | 19,506 | 28,389 |
| 742.15 | 19,617 | 29,367 |
| 742.20 | 19,727 | 30,351 |
| 742.25 | 19,837 | 31,340 |
| 742.30 | 19,947 | 32,334 |
| 742.35 | 20,057 | 33,335 |
| 742.40 | 20,168 | 34,340 |
| 742.45 | 20,278 | 35,351 |
| 742.50 | 20,388 | 36,368 |
| 742.55 | 20,498 | 37,390 |
| 742.60 | 20,608 | 38,418 |
| 742.65 | 20,719 | 39,451 |
| 742.70 | 20,829 | 40,490 |
| 742.75 | 20,939 | 41,534 |
| 742.80 | 21,049 | 42,584 |
| 742.85 | 21,159 | 43,639 |
| 742.90 | 21,270 | 44,700 |
| 742.95 | 21,380 | 45,766 |
| 743.00 | 21,490 | 46,838 |

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Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Pond P-2: Wet Pond P-2

Inflow Area = 17.240 ac, 69.47% Impervious, Inflow Depth = 2.24" for 10-yr event
 Inflow = 64.15 cfs @ 11.97 hrs, Volume= 3.217 af
 Outflow = 3.58 cfs @ 13.18 hrs, Volume= 3.112 af, Atten= 94%, Lag= 72.9 min
 Primary = 3.58 cfs @ 13.18 hrs, Volume= 3.112 af
 Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Peak Elev= 738.62' @ 13.18 hrs Surf.Area= 54,920 sf Storage= 80,627 cf

Plug-Flow detention time= 780.5 min calculated for 3.110 af (97% of inflow)
 Center-of-Mass det. time= 761.6 min (1,585.3 - 823.7)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|--|
| #1 | 730.00' | 0 cf | Retention (Irregular) Listed below (Recalc) 46,278 cf Overall x 0.0% Voids |
| #2 | 736.00' | 177,873 cf | Detention (Irregular) Listed below (Recalc) |
| | | 177,873 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|------------------|-------------------|---------------|------------------------|------------------------|------------------|
| 730.00 | 3,490 | 498.0 | 0 | 0 | 3,490 |
| 734.50 | 8,488 | 612.0 | 26,131 | 26,131 | 13,865 |
| 736.00 | 19,080 | 800.0 | 20,147 | 46,278 | 35,016 |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|------------------|-------------------|---------------|------------------------|------------------------|------------------|
| 736.00 | 25,870 | 957.0 | 0 | 0 | 25,870 |
| 741.00 | 46,260 | 1,082.0 | 177,873 | 177,873 | 46,783 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|--|
| #1 | Primary | 736.00' | 24.0" Round Culvert L= 220.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 736.00' / 735.17' S= 0.0038 '/ Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf |
| #2 | Device 1 | 738.75' | 24.0" W x 24.0" H 9° Grate C= 0.600 Limited to weir flow at low heads |
| #3 | Secondary | 740.00' | 20.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |
| #4 | Device 1 | 736.00' | 4.0" Round Culvert-Low Flow L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 735.00' / 736.00' S= -0.0667 '/ Cc= 0.900 n= 0.012, Flow Area= 0.09 sf |
| #5 | Device 1 | 737.65' | 18.0" W x 6.0" H Vert. Orifice-High C= 0.600 Limited to weir flow at low heads |

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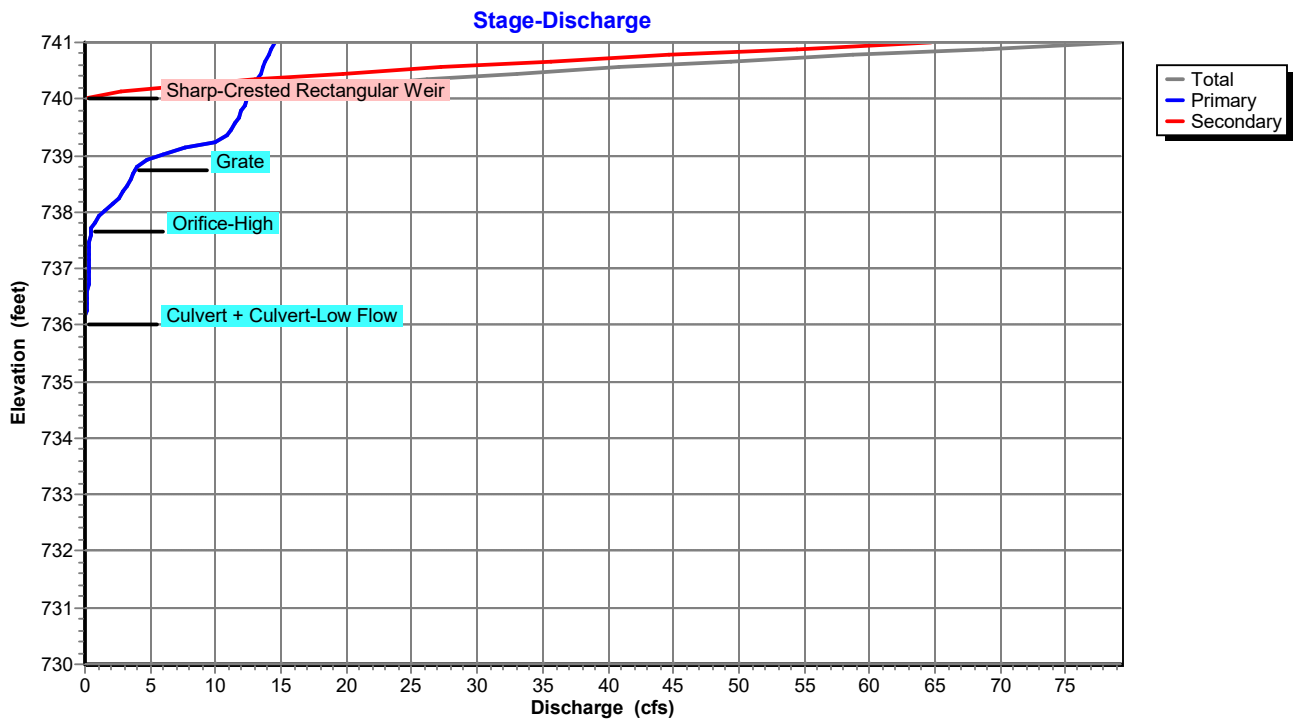
Primary OutFlow Max=3.58 cfs @ 13.18 hrs HW=738.62' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 3.58 cfs of 9.40 cfs potential flow)
- 2=Gate (Controls 0.00 cfs)
- 4=Culvert-Low Flow (Inlet Controls 0.52 cfs @ 5.96 fps)
- 5=Orifice-High (Orifice Controls 3.06 cfs @ 4.08 fps)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=730.00' TW=0.00' (Dynamic Tailwater)

- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond P-2: Wet Pond P-2



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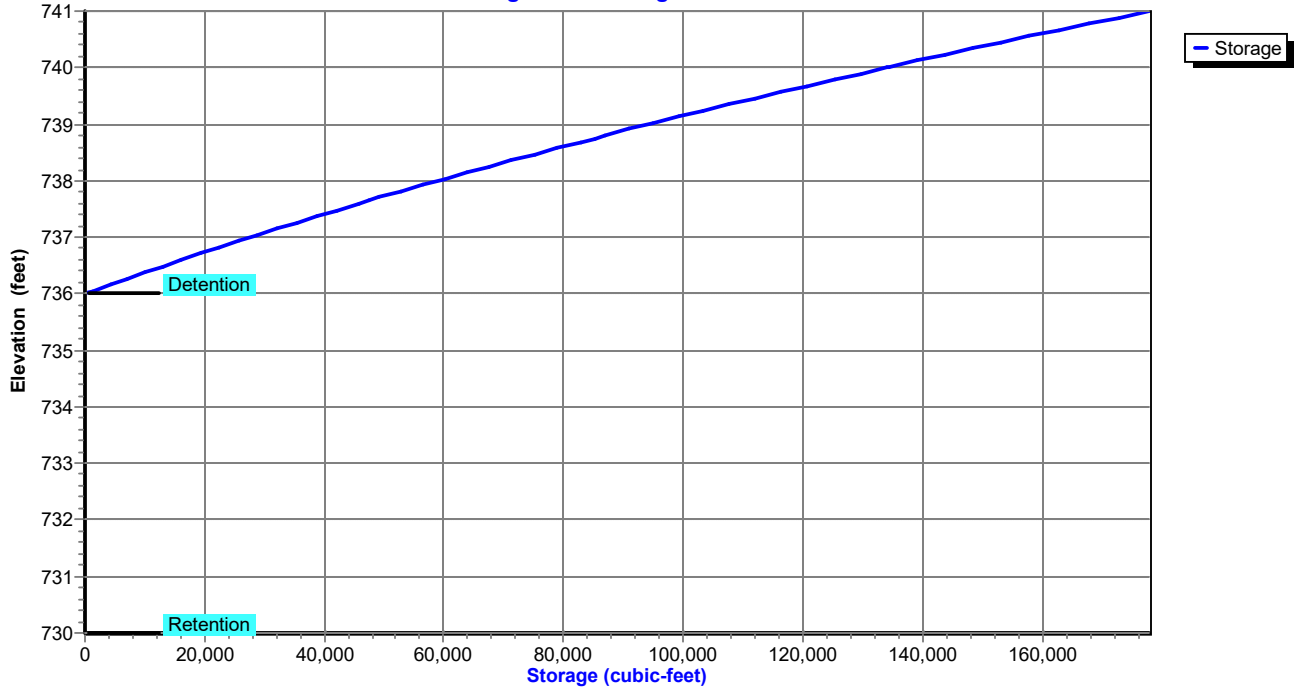
Proposed Conditions - III
Type II 24-hr 10-yr Rainfall=3.15"

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Pond P-2: Wet Pond P-2

Stage-Area-Storage



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Stage-Discharge for Pond P-2: Wet Pond P-2

| Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) | Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) |
|---------------------|--------------------|------------------|--------------------|---------------------|--------------------|------------------|--------------------|
| 730.00 | 0.00 | 0.00 | 0.00 | 737.65 | 0.40 | 0.40 | 0.00 |
| 730.15 | 0.00 | 0.00 | 0.00 | 737.80 | 0.70 | 0.70 | 0.00 |
| 730.30 | 0.00 | 0.00 | 0.00 | 737.95 | 1.23 | 1.23 | 0.00 |
| 730.45 | 0.00 | 0.00 | 0.00 | 738.10 | 1.91 | 1.91 | 0.00 |
| 730.60 | 0.00 | 0.00 | 0.00 | 738.25 | 2.56 | 2.56 | 0.00 |
| 730.75 | 0.00 | 0.00 | 0.00 | 738.40 | 3.02 | 3.02 | 0.00 |
| 730.90 | 0.00 | 0.00 | 0.00 | 738.55 | 3.41 | 3.41 | 0.00 |
| 731.05 | 0.00 | 0.00 | 0.00 | 738.70 | 3.74 | 3.74 | 0.00 |
| 731.20 | 0.00 | 0.00 | 0.00 | 738.85 | 4.31 | 4.31 | 0.00 |
| 731.35 | 0.00 | 0.00 | 0.00 | 739.00 | 5.65 | 5.65 | 0.00 |
| 731.50 | 0.00 | 0.00 | 0.00 | 739.15 | 8.00 | 8.00 | 0.00 |
| 731.65 | 0.00 | 0.00 | 0.00 | 739.30 | 10.78 | 10.78 | 0.00 |
| 731.80 | 0.00 | 0.00 | 0.00 | 739.45 | 11.16 | 11.16 | 0.00 |
| 731.95 | 0.00 | 0.00 | 0.00 | 739.60 | 11.52 | 11.52 | 0.00 |
| 732.10 | 0.00 | 0.00 | 0.00 | 739.75 | 11.87 | 11.87 | 0.00 |
| 732.25 | 0.00 | 0.00 | 0.00 | 739.90 | 12.21 | 12.21 | 0.00 |
| 732.40 | 0.00 | 0.00 | 0.00 | 740.05 | 13.27 | 12.54 | 0.73 |
| 732.55 | 0.00 | 0.00 | 0.00 | 740.20 | 18.70 | 12.86 | 5.84 |
| 732.70 | 0.00 | 0.00 | 0.00 | 740.35 | 26.67 | 13.18 | 13.49 |
| 732.85 | 0.00 | 0.00 | 0.00 | 740.50 | 36.49 | 13.48 | 23.01 |
| 733.00 | 0.00 | 0.00 | 0.00 | 740.65 | 47.83 | 13.78 | 34.05 |
| 733.15 | 0.00 | 0.00 | 0.00 | 740.80 | 60.50 | 14.08 | 46.42 |
| 733.30 | 0.00 | 0.00 | 0.00 | 740.95 | 74.35 | 14.37 | 59.98 |
| 733.45 | 0.00 | 0.00 | 0.00 | | | | |
| 733.60 | 0.00 | 0.00 | 0.00 | | | | |
| 733.75 | 0.00 | 0.00 | 0.00 | | | | |
| 733.90 | 0.00 | 0.00 | 0.00 | | | | |
| 734.05 | 0.00 | 0.00 | 0.00 | | | | |
| 734.20 | 0.00 | 0.00 | 0.00 | | | | |
| 734.35 | 0.00 | 0.00 | 0.00 | | | | |
| 734.50 | 0.00 | 0.00 | 0.00 | | | | |
| 734.65 | 0.00 | 0.00 | 0.00 | | | | |
| 734.80 | 0.00 | 0.00 | 0.00 | | | | |
| 734.95 | 0.00 | 0.00 | 0.00 | | | | |
| 735.10 | 0.00 | 0.00 | 0.00 | | | | |
| 735.25 | 0.00 | 0.00 | 0.00 | | | | |
| 735.40 | 0.00 | 0.00 | 0.00 | | | | |
| 735.55 | 0.00 | 0.00 | 0.00 | | | | |
| 735.70 | 0.00 | 0.00 | 0.00 | | | | |
| 735.85 | 0.00 | 0.00 | 0.00 | | | | |
| 736.00 | 0.00 | 0.00 | 0.00 | | | | |
| 736.15 | 0.04 | 0.04 | 0.00 | | | | |
| 736.30 | 0.12 | 0.12 | 0.00 | | | | |
| 736.45 | 0.18 | 0.18 | 0.00 | | | | |
| 736.60 | 0.22 | 0.22 | 0.00 | | | | |
| 736.75 | 0.25 | 0.25 | 0.00 | | | | |
| 736.90 | 0.28 | 0.28 | 0.00 | | | | |
| 737.05 | 0.31 | 0.31 | 0.00 | | | | |
| 737.20 | 0.34 | 0.34 | 0.00 | | | | |
| 737.35 | 0.36 | 0.36 | 0.00 | | | | |
| 737.50 | 0.38 | 0.38 | 0.00 | | | | |

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Proposed Conditions - III
Type II 24-hr 10-yr Rainfall=3.15"

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Stage-Area-Storage for Pond P-2: Wet Pond P-2

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---------------------|-------------------------|---------------------|-------------------------|
| 730.00 | 0 | 737.65 | 47,612 |
| 730.15 | 0 | 737.80 | 52,448 |
| 730.30 | 0 | 737.95 | 57,372 |
| 730.45 | 0 | 738.10 | 62,385 |
| 730.60 | 0 | 738.25 | 67,487 |
| 730.75 | 0 | 738.40 | 72,680 |
| 730.90 | 0 | 738.55 | 77,965 |
| 731.05 | 0 | 738.70 | 83,341 |
| 731.20 | 0 | 738.85 | 88,810 |
| 731.35 | 0 | 739.00 | 94,372 |
| 731.50 | 0 | 739.15 | 100,029 |
| 731.65 | 0 | 739.30 | 105,782 |
| 731.80 | 0 | 739.45 | 111,630 |
| 731.95 | 0 | 739.60 | 117,575 |
| 732.10 | 0 | 739.75 | 123,617 |
| 732.25 | 0 | 739.90 | 129,758 |
| 732.40 | 0 | 740.05 | 135,998 |
| 732.55 | 0 | 740.20 | 142,339 |
| 732.70 | 0 | 740.35 | 148,779 |
| 732.85 | 0 | 740.50 | 155,322 |
| 733.00 | 0 | 740.65 | 161,967 |
| 733.15 | 0 | 740.80 | 168,714 |
| 733.30 | 0 | 740.95 | 175,566 |
| 733.45 | 0 | | |
| 733.60 | 0 | | |
| 733.75 | 0 | | |
| 733.90 | 0 | | |
| 734.05 | 0 | | |
| 734.20 | 0 | | |
| 734.35 | 0 | | |
| 734.50 | 0 | | |
| 734.65 | 0 | | |
| 734.80 | 0 | | |
| 734.95 | 0 | | |
| 735.10 | 0 | | |
| 735.25 | 0 | | |
| 735.40 | 0 | | |
| 735.55 | 0 | | |
| 735.70 | 0 | | |
| 735.85 | 0 | | |
| 736.00 | 0 | | |
| 736.15 | 3,920 | | |
| 736.30 | 7,919 | | |
| 736.45 | 11,998 | | |
| 736.60 | 16,159 | | |
| 736.75 | 20,401 | | |
| 736.90 | 24,725 | | |
| 737.05 | 29,133 | | |
| 737.20 | 33,624 | | |
| 737.35 | 38,201 | | |
| 737.50 | 42,863 | | |

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Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Link 3AR-I: 3A Reach

Inflow Area = 17.240 ac, 69.47% Impervious, Inflow Depth > 2.17" for 10-yr event
Inflow = 3.58 cfs @ 13.18 hrs, Volume= 3.112 af
Primary = 3.58 cfs @ 13.24 hrs, Volume= 3.112 af, Atten= 0%, Lag= 3.6 min

Primary outflow = Inflow delayed by 3.6 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Summary for Link 3AR-II: 3A Reach

Inflow Area = 48.574 ac, 49.82% Impervious, Inflow Depth > 1.98" for 10-yr event
Inflow = 45.25 cfs @ 12.36 hrs, Volume= 7.996 af
Primary = 45.08 cfs @ 12.39 hrs, Volume= 7.996 af, Atten= 0%, Lag= 1.6 min

Primary outflow = Inflow delayed by 1.6 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Link 3AT: DA #3A Total

Inflow Area = 48.574 ac, 49.82% Impervious, Inflow Depth > 1.98" for 10-yr event
Inflow = 45.25 cfs @ 12.36 hrs, Volume= 7.996 af
Primary = 45.25 cfs @ 12.36 hrs, Volume= 7.996 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Link 3BP: Bypass

Inflow Area = 14.938 ac, 77.61% Impervious, Inflow Depth = 2.50" for 10-yr event
Inflow = 59.75 cfs @ 11.96 hrs, Volume= 3.106 af
Primary = 14.30 cfs @ 11.70 hrs, Volume= 2.369 af, Atten= 76%, Lag= 0.0 min
Secondary = 45.45 cfs @ 11.96 hrs, Volume= 0.737 af

Primary outflow = Inflow below 14.30 cfs, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Link 3BR: 3B Reach

Inflow Area = 7.407 ac, 19.33% Impervious, Inflow Depth = 1.64" for 10-yr event
Inflow = 13.28 cfs @ 12.13 hrs, Volume= 1.013 af
Primary = 13.17 cfs @ 12.28 hrs, Volume= 1.013 af, Atten= 1%, Lag= 8.5 min

Primary outflow = Inflow delayed by 8.5 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - III
Type II 24-hr 10-yr Rainfall=3.15"

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Summary for Link DP-3: DP #3 - Rush Crk

Inflow Area = 55.981 ac, 45.79% Impervious, Inflow Depth > 1.93" for 10-yr event
Inflow = 56.47 cfs @ 12.34 hrs, Volume= 9.009 af
Primary = 56.47 cfs @ 12.34 hrs, Volume= 9.009 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - III
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 3A-I: DA #3A-I

Runoff = 56.84 cfs @ 12.35 hrs, Volume= 6.574 af, Depth= 2.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 19.111 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 12.223 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 31.334 | 87 | Weighted Average |
| 19.111 | | 60.99% Pervious Area |
| 12.223 | | 39.01% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 31.4 | 150 | 0.0100 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 3.9 | 380 | 0.0100 | 1.61 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 1.2 | 146 | 0.0100 | 2.03 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.9 | 774 | | 4.50 | | Direct Entry, Pipe Flow |
| 39.4 | 1,450 | Total | | | |

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Proposed Conditions - III

Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 3A-II: DA #3A-II

Runoff = 75.34 cfs @ 11.96 hrs, Volume= 3.980 af, Depth= 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 3.345 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 11.593 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 14.938 | 94 | Weighted Average |
| 3.345 | | 22.39% Pervious Area |
| 11.593 | | 77.61% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.6 | 100 | 0.0150 | 1.02 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 0.7 | 100 | 0.0150 | 2.49 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.3 | 200 | | | | Total, Increased to minimum Tc = 6.0 min |

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Proposed Conditions - III
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 3A-III: DA #3A-III

Runoff = 8.56 cfs @ 11.97 hrs, Volume= 0.417 af, Depth= 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 1.918 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 0.384 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 2.302 | 83 | Weighted Average |
| 1.918 | | 83.32% Pervious Area |
| 0.384 | | 16.68% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.6 | 100 | 0.0150 | 1.02 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 3.9 | 860 | 0.0330 | 3.69 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 5.5 | 960 | | | | Total, Increased to minimum Tc = 6.0 min |

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 Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Subcatchment 3B: DA #3B

Runoff = 18.27 cfs @ 12.13 hrs, Volume= 1.393 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-yr Rainfall=3.87"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 5.920 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 1.432 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.055 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 7.407 | 84 | Weighted Average |
| 5.975 | | 80.67% Pervious Area |
| 1.432 | | 19.33% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 19.3 | 100 | 0.0150 | 0.09 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 1.1 | 130 | 0.0150 | 1.97 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 20.4 | 230 | Total | | | |

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Proposed Conditions - III
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Pond B-5: Bioretention B-5

Inflow Area = 14.938 ac, 77.61% Impervious, Inflow Depth = 2.33" for 25-yr event
Inflow = 14.30 cfs @ 11.70 hrs, Volume= 2.903 af
Outflow = 13.22 cfs @ 11.99 hrs, Volume= 2.714 af, Atten= 8%, Lag= 17.6 min
Primary = 13.22 cfs @ 11.99 hrs, Volume= 2.714 af
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 741.69' @ 12.19 hrs Surf.Area= 18,612 sf Storage= 20,655 cf

Plug-Flow detention time= 88.2 min calculated for 2.712 af (93% of inflow)
Center-of-Mass det. time= 50.9 min (851.5 - 800.6)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|--|
| #1 | 740.50' | 46,838 cf | Surf. Storage (Prismatic) Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 740.50 | 15,980 | 0 | 0 |
| 743.00 | 21,490 | 46,838 | 46,838 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|--|
| #1 | Primary | 737.00' | 18.0" Round Culvert L= 170.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 737.00' / 736.00' S= 0.0059 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf |
| #2 | Device 1 | 741.00' | 24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads |
| #3 | Secondary | 742.50' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=12.60 cfs @ 11.99 hrs HW=741.63' TW=738.36' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 12.60 cfs @ 7.13 fps)

↑2=Grate (Passes 12.60 cfs of 13.15 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=740.50' TW=0.00' (Dynamic Tailwater)

↑3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

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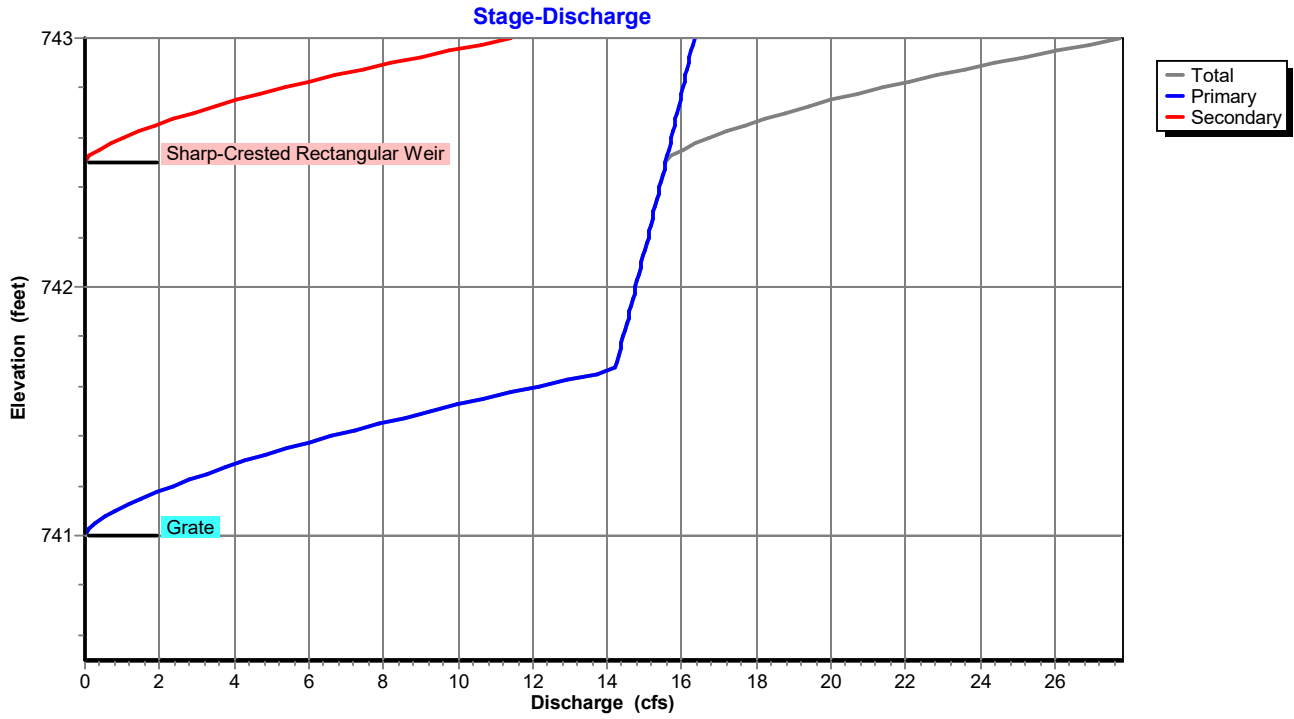
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Proposed Conditions - III
Type II 24-hr 25-yr Rainfall=3.87"

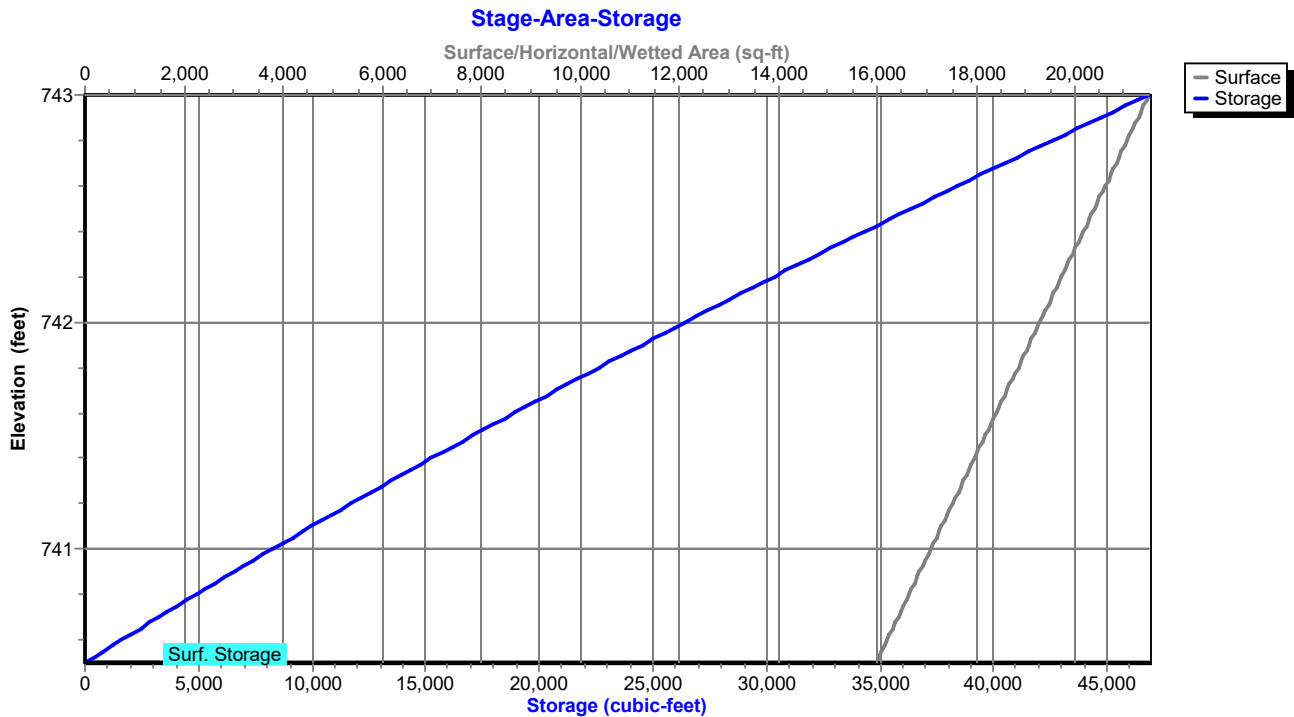
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Pond B-5: Bioretention B-5



Pond B-5: Bioretention B-5



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Type II 24-hr 25-yr Rainfall=3.87"

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Stage-Discharge for Pond B-5: Bioretention B-5

| Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) |
|---------------------|--------------------|------------------|--------------------|
| 740.50 | 0.00 | 0.00 | 0.00 |
| 740.55 | 0.00 | 0.00 | 0.00 |
| 740.60 | 0.00 | 0.00 | 0.00 |
| 740.65 | 0.00 | 0.00 | 0.00 |
| 740.70 | 0.00 | 0.00 | 0.00 |
| 740.75 | 0.00 | 0.00 | 0.00 |
| 740.80 | 0.00 | 0.00 | 0.00 |
| 740.85 | 0.00 | 0.00 | 0.00 |
| 740.90 | 0.00 | 0.00 | 0.00 |
| 740.95 | 0.00 | 0.00 | 0.00 |
| 741.00 | 0.00 | 0.00 | 0.00 |
| 741.05 | 0.29 | 0.29 | 0.00 |
| 741.10 | 0.83 | 0.83 | 0.00 |
| 741.15 | 1.52 | 1.52 | 0.00 |
| 741.20 | 2.34 | 2.34 | 0.00 |
| 741.25 | 3.27 | 3.27 | 0.00 |
| 741.30 | 4.30 | 4.30 | 0.00 |
| 741.35 | 5.42 | 5.42 | 0.00 |
| 741.40 | 6.62 | 6.62 | 0.00 |
| 741.45 | 7.90 | 7.90 | 0.00 |
| 741.50 | 9.25 | 9.25 | 0.00 |
| 741.55 | 10.67 | 10.67 | 0.00 |
| 741.60 | 12.16 | 12.16 | 0.00 |
| 741.65 | 13.71 | 13.71 | 0.00 |
| 741.70 | 14.27 | 14.27 | 0.00 |
| 741.75 | 14.35 | 14.35 | 0.00 |
| 741.80 | 14.44 | 14.44 | 0.00 |
| 741.85 | 14.52 | 14.52 | 0.00 |
| 741.90 | 14.60 | 14.60 | 0.00 |
| 741.95 | 14.69 | 14.69 | 0.00 |
| 742.00 | 14.77 | 14.77 | 0.00 |
| 742.05 | 14.85 | 14.85 | 0.00 |
| 742.10 | 14.93 | 14.93 | 0.00 |
| 742.15 | 15.01 | 15.01 | 0.00 |
| 742.20 | 15.09 | 15.09 | 0.00 |
| 742.25 | 15.17 | 15.17 | 0.00 |
| 742.30 | 15.25 | 15.25 | 0.00 |
| 742.35 | 15.33 | 15.33 | 0.00 |
| 742.40 | 15.41 | 15.41 | 0.00 |
| 742.45 | 15.49 | 15.49 | 0.00 |
| 742.50 | 15.57 | 15.57 | 0.00 |
| 742.55 | 16.01 | 15.65 | 0.37 |
| 742.60 | 16.75 | 15.72 | 1.03 |
| 742.65 | 17.69 | 15.80 | 1.89 |
| 742.70 | 18.79 | 15.88 | 2.91 |
| 742.75 | 20.02 | 15.95 | 4.07 |
| 742.80 | 21.37 | 16.03 | 5.34 |
| 742.85 | 22.83 | 16.10 | 6.72 |
| 742.90 | 24.38 | 16.18 | 8.21 |
| 742.95 | 26.04 | 16.25 | 9.78 |
| 743.00 | 27.77 | 16.33 | 11.45 |

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Stage-Area-Storage for Pond B-5: Bioretention B-5

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|
| 740.50 | 15,980 | 0 |
| 740.55 | 16,090 | 802 |
| 740.60 | 16,200 | 1,609 |
| 740.65 | 16,311 | 2,422 |
| 740.70 | 16,421 | 3,240 |
| 740.75 | 16,531 | 4,064 |
| 740.80 | 16,641 | 4,893 |
| 740.85 | 16,751 | 5,728 |
| 740.90 | 16,862 | 6,568 |
| 740.95 | 16,972 | 7,414 |
| 741.00 | 17,082 | 8,266 |
| 741.05 | 17,192 | 9,122 |
| 741.10 | 17,302 | 9,985 |
| 741.15 | 17,413 | 10,853 |
| 741.20 | 17,523 | 11,726 |
| 741.25 | 17,633 | 12,605 |
| 741.30 | 17,743 | 13,489 |
| 741.35 | 17,853 | 14,379 |
| 741.40 | 17,964 | 15,275 |
| 741.45 | 18,074 | 16,176 |
| 741.50 | 18,184 | 17,082 |
| 741.55 | 18,294 | 17,994 |
| 741.60 | 18,404 | 18,911 |
| 741.65 | 18,515 | 19,834 |
| 741.70 | 18,625 | 20,763 |
| 741.75 | 18,735 | 21,697 |
| 741.80 | 18,845 | 22,636 |
| 741.85 | 18,955 | 23,581 |
| 741.90 | 19,066 | 24,532 |
| 741.95 | 19,176 | 25,488 |
| 742.00 | 19,286 | 26,450 |
| 742.05 | 19,396 | 27,417 |
| 742.10 | 19,506 | 28,389 |
| 742.15 | 19,617 | 29,367 |
| 742.20 | 19,727 | 30,351 |
| 742.25 | 19,837 | 31,340 |
| 742.30 | 19,947 | 32,334 |
| 742.35 | 20,057 | 33,335 |
| 742.40 | 20,168 | 34,340 |
| 742.45 | 20,278 | 35,351 |
| 742.50 | 20,388 | 36,368 |
| 742.55 | 20,498 | 37,390 |
| 742.60 | 20,608 | 38,418 |
| 742.65 | 20,719 | 39,451 |
| 742.70 | 20,829 | 40,490 |
| 742.75 | 20,939 | 41,534 |
| 742.80 | 21,049 | 42,584 |
| 742.85 | 21,159 | 43,639 |
| 742.90 | 21,270 | 44,700 |
| 742.95 | 21,380 | 45,766 |
| 743.00 | 21,490 | 46,838 |

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Proposed Conditions - III
Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Pond P-2: Wet Pond P-2

Inflow Area = 17.240 ac, 69.47% Impervious, Inflow Depth = 2.93" for 25-yr event
 Inflow = 82.52 cfs @ 11.97 hrs, Volume= 4.207 af
 Outflow = 7.89 cfs @ 12.65 hrs, Volume= 4.099 af, Atten= 90%, Lag= 41.1 min
 Primary = 7.89 cfs @ 12.65 hrs, Volume= 4.099 af
 Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Peak Elev= 739.14' @ 12.65 hrs Surf.Area= 57,086 sf Storage= 99,813 cf

Plug-Flow detention time= 637.7 min calculated for 4.099 af (97% of inflow)
 Center-of-Mass det. time= 621.1 min (1,435.0 - 813.8)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|--|
| #1 | 730.00' | 0 cf | Retention (Irregular) Listed below (Recalc) 46,278 cf Overall x 0.0% Voids |
| #2 | 736.00' | 177,873 cf | Detention (Irregular) Listed below (Recalc) |
| | | 177,873 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|------------------|-------------------|---------------|------------------------|------------------------|------------------|
| 730.00 | 3,490 | 498.0 | 0 | 0 | 3,490 |
| 734.50 | 8,488 | 612.0 | 26,131 | 26,131 | 13,865 |
| 736.00 | 19,080 | 800.0 | 20,147 | 46,278 | 35,016 |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|------------------|-------------------|---------------|------------------------|------------------------|------------------|
| 736.00 | 25,870 | 957.0 | 0 | 0 | 25,870 |
| 741.00 | 46,260 | 1,082.0 | 177,873 | 177,873 | 46,783 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|--|
| #1 | Primary | 736.00' | 24.0" Round Culvert L= 220.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 736.00' / 735.17' S= 0.0038 '/ Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf |
| #2 | Device 1 | 738.75' | 24.0" W x 24.0" H 9° Grate C= 0.600 Limited to weir flow at low heads |
| #3 | Secondary | 740.00' | 20.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |
| #4 | Device 1 | 736.00' | 4.0" Round Culvert-Low Flow L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 735.00' / 736.00' S= -0.0667 '/ Cc= 0.900 n= 0.012, Flow Area= 0.09 sf |
| #5 | Device 1 | 737.65' | 18.0" W x 6.0" H Vert. Orifice-High C= 0.600 Limited to weir flow at low heads |

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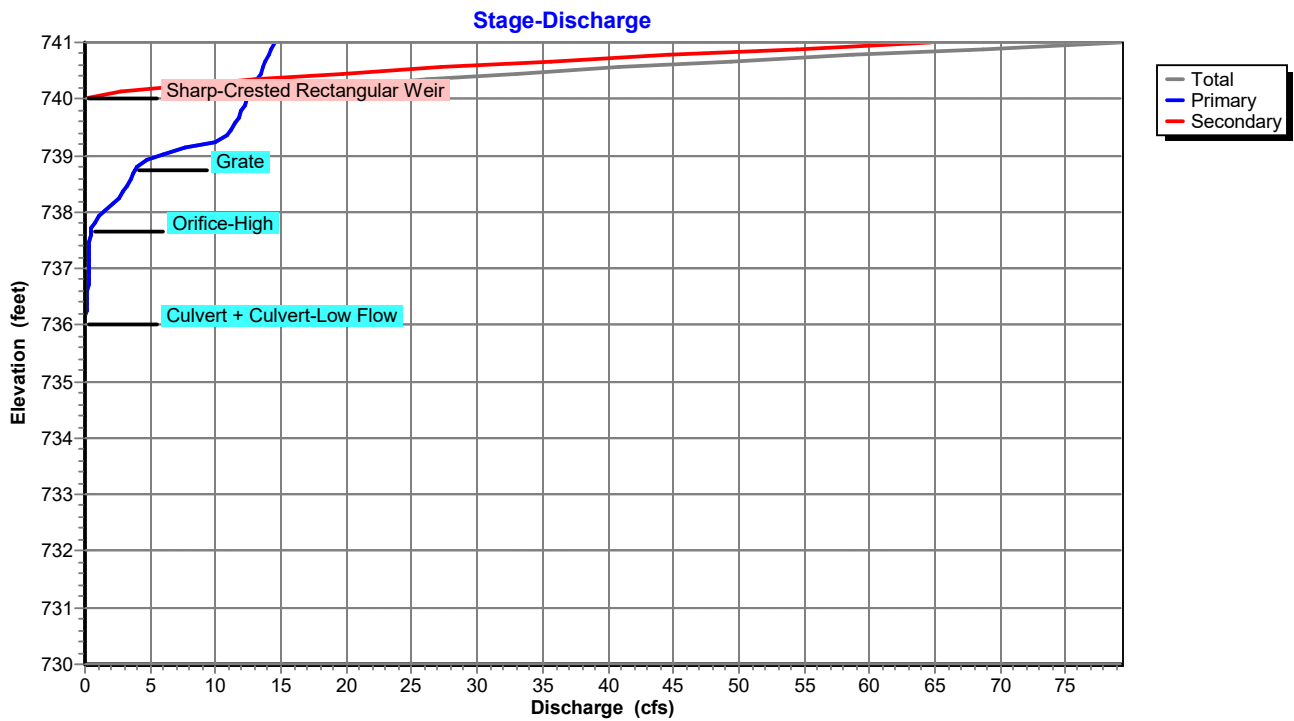
Primary OutFlow Max=7.88 cfs @ 12.65 hrs HW=739.14' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Passes 7.88 cfs of 10.38 cfs potential flow)
- 2=Gate (Weir Controls 3.29 cfs @ 1.74 fps)
- 4=Culvert-Low Flow (Inlet Controls 0.57 cfs @ 6.56 fps)
- 5=Orifice-High (Orifice Controls 4.02 cfs @ 5.36 fps)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=730.00' TW=0.00' (Dynamic Tailwater)

- 3=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond P-2: Wet Pond P-2



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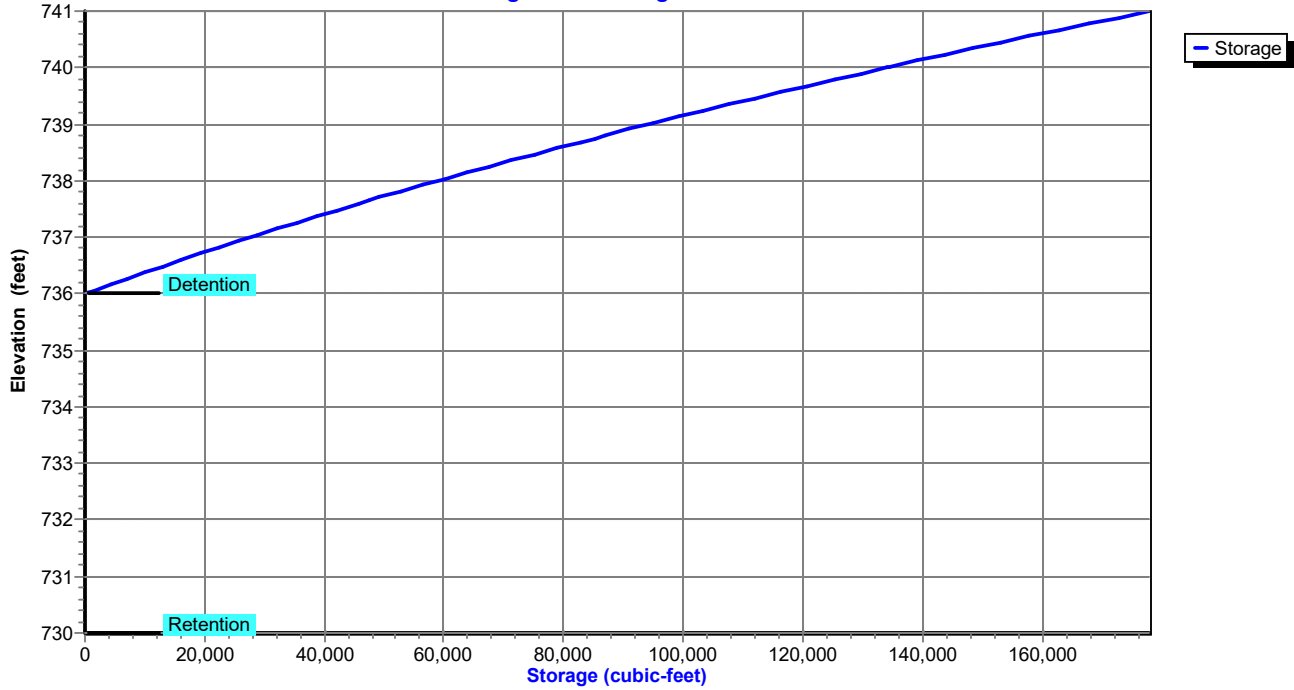
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Pond P-2: Wet Pond P-2

Stage-Area-Storage



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 Type II 24-hr 25-yr Rainfall=3.87"

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Stage-Discharge for Pond P-2: Wet Pond P-2

| Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) | Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) |
|---------------------|--------------------|------------------|--------------------|---------------------|--------------------|------------------|--------------------|
| 730.00 | 0.00 | 0.00 | 0.00 | 737.65 | 0.40 | 0.40 | 0.00 |
| 730.15 | 0.00 | 0.00 | 0.00 | 737.80 | 0.70 | 0.70 | 0.00 |
| 730.30 | 0.00 | 0.00 | 0.00 | 737.95 | 1.23 | 1.23 | 0.00 |
| 730.45 | 0.00 | 0.00 | 0.00 | 738.10 | 1.91 | 1.91 | 0.00 |
| 730.60 | 0.00 | 0.00 | 0.00 | 738.25 | 2.56 | 2.56 | 0.00 |
| 730.75 | 0.00 | 0.00 | 0.00 | 738.40 | 3.02 | 3.02 | 0.00 |
| 730.90 | 0.00 | 0.00 | 0.00 | 738.55 | 3.41 | 3.41 | 0.00 |
| 731.05 | 0.00 | 0.00 | 0.00 | 738.70 | 3.74 | 3.74 | 0.00 |
| 731.20 | 0.00 | 0.00 | 0.00 | 738.85 | 4.31 | 4.31 | 0.00 |
| 731.35 | 0.00 | 0.00 | 0.00 | 739.00 | 5.65 | 5.65 | 0.00 |
| 731.50 | 0.00 | 0.00 | 0.00 | 739.15 | 8.00 | 8.00 | 0.00 |
| 731.65 | 0.00 | 0.00 | 0.00 | 739.30 | 10.78 | 10.78 | 0.00 |
| 731.80 | 0.00 | 0.00 | 0.00 | 739.45 | 11.16 | 11.16 | 0.00 |
| 731.95 | 0.00 | 0.00 | 0.00 | 739.60 | 11.52 | 11.52 | 0.00 |
| 732.10 | 0.00 | 0.00 | 0.00 | 739.75 | 11.87 | 11.87 | 0.00 |
| 732.25 | 0.00 | 0.00 | 0.00 | 739.90 | 12.21 | 12.21 | 0.00 |
| 732.40 | 0.00 | 0.00 | 0.00 | 740.05 | 13.27 | 12.54 | 0.73 |
| 732.55 | 0.00 | 0.00 | 0.00 | 740.20 | 18.70 | 12.86 | 5.84 |
| 732.70 | 0.00 | 0.00 | 0.00 | 740.35 | 26.67 | 13.18 | 13.49 |
| 732.85 | 0.00 | 0.00 | 0.00 | 740.50 | 36.49 | 13.48 | 23.01 |
| 733.00 | 0.00 | 0.00 | 0.00 | 740.65 | 47.83 | 13.78 | 34.05 |
| 733.15 | 0.00 | 0.00 | 0.00 | 740.80 | 60.50 | 14.08 | 46.42 |
| 733.30 | 0.00 | 0.00 | 0.00 | 740.95 | 74.35 | 14.37 | 59.98 |
| 733.45 | 0.00 | 0.00 | 0.00 | | | | |
| 733.60 | 0.00 | 0.00 | 0.00 | | | | |
| 733.75 | 0.00 | 0.00 | 0.00 | | | | |
| 733.90 | 0.00 | 0.00 | 0.00 | | | | |
| 734.05 | 0.00 | 0.00 | 0.00 | | | | |
| 734.20 | 0.00 | 0.00 | 0.00 | | | | |
| 734.35 | 0.00 | 0.00 | 0.00 | | | | |
| 734.50 | 0.00 | 0.00 | 0.00 | | | | |
| 734.65 | 0.00 | 0.00 | 0.00 | | | | |
| 734.80 | 0.00 | 0.00 | 0.00 | | | | |
| 734.95 | 0.00 | 0.00 | 0.00 | | | | |
| 735.10 | 0.00 | 0.00 | 0.00 | | | | |
| 735.25 | 0.00 | 0.00 | 0.00 | | | | |
| 735.40 | 0.00 | 0.00 | 0.00 | | | | |
| 735.55 | 0.00 | 0.00 | 0.00 | | | | |
| 735.70 | 0.00 | 0.00 | 0.00 | | | | |
| 735.85 | 0.00 | 0.00 | 0.00 | | | | |
| 736.00 | 0.00 | 0.00 | 0.00 | | | | |
| 736.15 | 0.04 | 0.04 | 0.00 | | | | |
| 736.30 | 0.12 | 0.12 | 0.00 | | | | |
| 736.45 | 0.18 | 0.18 | 0.00 | | | | |
| 736.60 | 0.22 | 0.22 | 0.00 | | | | |
| 736.75 | 0.25 | 0.25 | 0.00 | | | | |
| 736.90 | 0.28 | 0.28 | 0.00 | | | | |
| 737.05 | 0.31 | 0.31 | 0.00 | | | | |
| 737.20 | 0.34 | 0.34 | 0.00 | | | | |
| 737.35 | 0.36 | 0.36 | 0.00 | | | | |
| 737.50 | 0.38 | 0.38 | 0.00 | | | | |

Proposed Conditions III

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Proposed Conditions - III
Type II 24-hr 25-yr Rainfall=3.87"

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Stage-Area-Storage for Pond P-2: Wet Pond P-2

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---------------------|-------------------------|---------------------|-------------------------|
| 730.00 | 0 | 737.65 | 47,612 |
| 730.15 | 0 | 737.80 | 52,448 |
| 730.30 | 0 | 737.95 | 57,372 |
| 730.45 | 0 | 738.10 | 62,385 |
| 730.60 | 0 | 738.25 | 67,487 |
| 730.75 | 0 | 738.40 | 72,680 |
| 730.90 | 0 | 738.55 | 77,965 |
| 731.05 | 0 | 738.70 | 83,341 |
| 731.20 | 0 | 738.85 | 88,810 |
| 731.35 | 0 | 739.00 | 94,372 |
| 731.50 | 0 | 739.15 | 100,029 |
| 731.65 | 0 | 739.30 | 105,782 |
| 731.80 | 0 | 739.45 | 111,630 |
| 731.95 | 0 | 739.60 | 117,575 |
| 732.10 | 0 | 739.75 | 123,617 |
| 732.25 | 0 | 739.90 | 129,758 |
| 732.40 | 0 | 740.05 | 135,998 |
| 732.55 | 0 | 740.20 | 142,339 |
| 732.70 | 0 | 740.35 | 148,779 |
| 732.85 | 0 | 740.50 | 155,322 |
| 733.00 | 0 | 740.65 | 161,967 |
| 733.15 | 0 | 740.80 | 168,714 |
| 733.30 | 0 | 740.95 | 175,566 |
| 733.45 | 0 | | |
| 733.60 | 0 | | |
| 733.75 | 0 | | |
| 733.90 | 0 | | |
| 734.05 | 0 | | |
| 734.20 | 0 | | |
| 734.35 | 0 | | |
| 734.50 | 0 | | |
| 734.65 | 0 | | |
| 734.80 | 0 | | |
| 734.95 | 0 | | |
| 735.10 | 0 | | |
| 735.25 | 0 | | |
| 735.40 | 0 | | |
| 735.55 | 0 | | |
| 735.70 | 0 | | |
| 735.85 | 0 | | |
| 736.00 | 0 | | |
| 736.15 | 3,920 | | |
| 736.30 | 7,919 | | |
| 736.45 | 11,998 | | |
| 736.60 | 16,159 | | |
| 736.75 | 20,401 | | |
| 736.90 | 24,725 | | |
| 737.05 | 29,133 | | |
| 737.20 | 33,624 | | |
| 737.35 | 38,201 | | |
| 737.50 | 42,863 | | |

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Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Link 3AR-I: 3A Reach

Inflow Area = 17.240 ac, 69.47% Impervious, Inflow Depth > 2.85" for 25-yr event
Inflow = 7.89 cfs @ 12.65 hrs, Volume= 4.099 af
Primary = 7.88 cfs @ 12.71 hrs, Volume= 4.099 af, Atten= 0%, Lag= 3.7 min

Primary outflow = Inflow delayed by 3.6 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Summary for Link 3AR-II: 3A Reach

Inflow Area = 48.574 ac, 49.82% Impervious, Inflow Depth > 2.64" for 25-yr event
Inflow = 62.85 cfs @ 12.36 hrs, Volume= 10.673 af
Primary = 62.62 cfs @ 12.39 hrs, Volume= 10.673 af, Atten= 0%, Lag= 1.6 min

Primary outflow = Inflow delayed by 1.6 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Summary for Link 3AT: DA #3A Total

Inflow Area = 48.574 ac, 49.82% Impervious, Inflow Depth > 2.64" for 25-yr event
Inflow = 62.85 cfs @ 12.36 hrs, Volume= 10.673 af
Primary = 62.85 cfs @ 12.36 hrs, Volume= 10.673 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Link 3BP: Bypass

Inflow Area = 14.938 ac, 77.61% Impervious, Inflow Depth = 3.20" for 25-yr event
Inflow = 75.34 cfs @ 11.96 hrs, Volume= 3.980 af
Primary = 14.30 cfs @ 11.70 hrs, Volume= 2.903 af, Atten= 81%, Lag= 0.0 min
Secondary = 61.04 cfs @ 11.96 hrs, Volume= 1.076 af

Primary outflow = Inflow below 14.30 cfs, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Summary for Link 3BR: 3B Reach

Inflow Area = 7.407 ac, 19.33% Impervious, Inflow Depth = 2.26" for 25-yr event
Inflow = 18.27 cfs @ 12.13 hrs, Volume= 1.393 af
Primary = 18.16 cfs @ 12.27 hrs, Volume= 1.393 af, Atten= 1%, Lag= 8.5 min

Primary outflow = Inflow delayed by 8.5 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 25-yr Rainfall=3.87"

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Summary for Link DP-3: DP #3 - Rush Crk

Inflow Area = 55.981 ac, 45.79% Impervious, Inflow Depth > 2.59" for 25-yr event
Inflow = 78.16 cfs @ 12.34 hrs, Volume= 12.066 af
Primary = 78.16 cfs @ 12.34 hrs, Volume= 12.066 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 3A-I: DA #3A-I

Runoff = 85.61 cfs @ 12.35 hrs, Volume= 9.981 af, Depth= 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 19.111 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 12.223 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 31.334 | 87 | Weighted Average |
| 19.111 | | 60.99% Pervious Area |
| 12.223 | | 39.01% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 31.4 | 150 | 0.0100 | 0.08 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 3.9 | 380 | 0.0100 | 1.61 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 1.2 | 146 | 0.0100 | 2.03 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.9 | 774 | | 4.50 | | Direct Entry, Pipe Flow |
| 39.4 | 1,450 | Total | | | |

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Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 3A-II: DA #3A-II

Runoff = 105.36 cfs @ 11.96 hrs, Volume= 5.695 af, Depth= 4.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 3.345 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 11.593 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 14.938 | 94 | Weighted Average |
| 3.345 | | 22.39% Pervious Area |
| 11.593 | | 77.61% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 1.6 | 100 | 0.0150 | 1.02 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 0.7 | 100 | 0.0150 | 2.49 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 2.3 | 200 | | | | Total, Increased to minimum Tc = 6.0 min |

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 Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 3A-III: DA #3A-III

Runoff = 13.24 cfs @ 11.97 hrs, Volume= 0.656 af, Depth= 3.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 1.918 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 0.384 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.000 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 2.302 | 83 | Weighted Average |
| 1.918 | | 83.32% Pervious Area |
| 0.384 | | 16.68% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|--|-------------------|----------------|--|
| 1.6 | 100 | 0.0150 | 1.02 | | Sheet Flow, Smooth surfaces n= 0.011 P2= 2.20" |
| 3.9 | 860 | 0.0330 | 3.69 | | Shallow Concentrated Flow, Paved Kv= 20.3 fps |
| 5.5 | 960 | Total, Increased to minimum Tc = 6.0 min | | | |

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 Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Subcatchment 3B: DA #3B

Runoff = 28.27 cfs @ 12.13 hrs, Volume= 2.172 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Type II 24-hr 100-yr Rainfall=5.27"

| Area (ac) | CN | Description |
|-----------|----|-------------------------------|
| 0.000 | 74 | >75% Grass cover, Good, HSG C |
| 5.920 | 80 | >75% Grass cover, Good, HSG D |
| 0.000 | 98 | Paved parking, HSG C |
| 1.432 | 98 | Paved parking, HSG D |
| 0.000 | 96 | Gravel surface, HSG C |
| 0.055 | 96 | Gravel surface, HSG D |
| 0.000 | 77 | Woods, Good, HSG D |
| 7.407 | 84 | Weighted Average |
| 5.975 | | 80.67% Pervious Area |
| 1.432 | | 19.33% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 19.3 | 100 | 0.0150 | 0.09 | | Sheet Flow, Grass: Dense n= 0.240 P2= 2.20" |
| 1.1 | 130 | 0.0150 | 1.97 | | Shallow Concentrated Flow, Unpaved Kv= 16.1 fps |
| 20.4 | 230 | Total | | | |

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Proposed Conditions - III
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Pond B-5: Bioretention B-5

Inflow Area = 14.938 ac, 77.61% Impervious, Inflow Depth = 3.15" for 100-yr event
Inflow = 14.30 cfs @ 11.65 hrs, Volume= 3.923 af
Outflow = 12.95 cfs @ 11.89 hrs, Volume= 3.733 af, Atten= 9%, Lag= 14.3 min
Primary = 12.95 cfs @ 11.89 hrs, Volume= 3.733 af
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
Peak Elev= 741.94' @ 12.43 hrs Surf.Area= 19,162 sf Storage= 25,369 cf

Plug-Flow detention time= 78.1 min calculated for 3.733 af (95% of inflow)
Center-of-Mass det. time= 48.1 min (840.4 - 792.3)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|--|
| #1 | 740.50' | 46,838 cf | Surf. Storage (Prismatic) Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 740.50 | 15,980 | 0 | 0 |
| 743.00 | 21,490 | 46,838 | 46,838 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|--|
| #1 | Primary | 737.00' | 18.0" Round Culvert L= 170.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 737.00' / 736.00' S= 0.0059 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf |
| #2 | Device 1 | 741.00' | 24.0" x 24.0" Horiz. Grate C= 0.600 Limited to weir flow at low heads |
| #3 | Secondary | 742.50' | 10.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |

Primary OutFlow Max=12.33 cfs @ 11.89 hrs HW=741.63' TW=738.49' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 12.33 cfs @ 6.98 fps)

↑**2=Grate** (Passes 12.33 cfs of 13.00 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=740.50' TW=0.00' (Dynamic Tailwater)

↑**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

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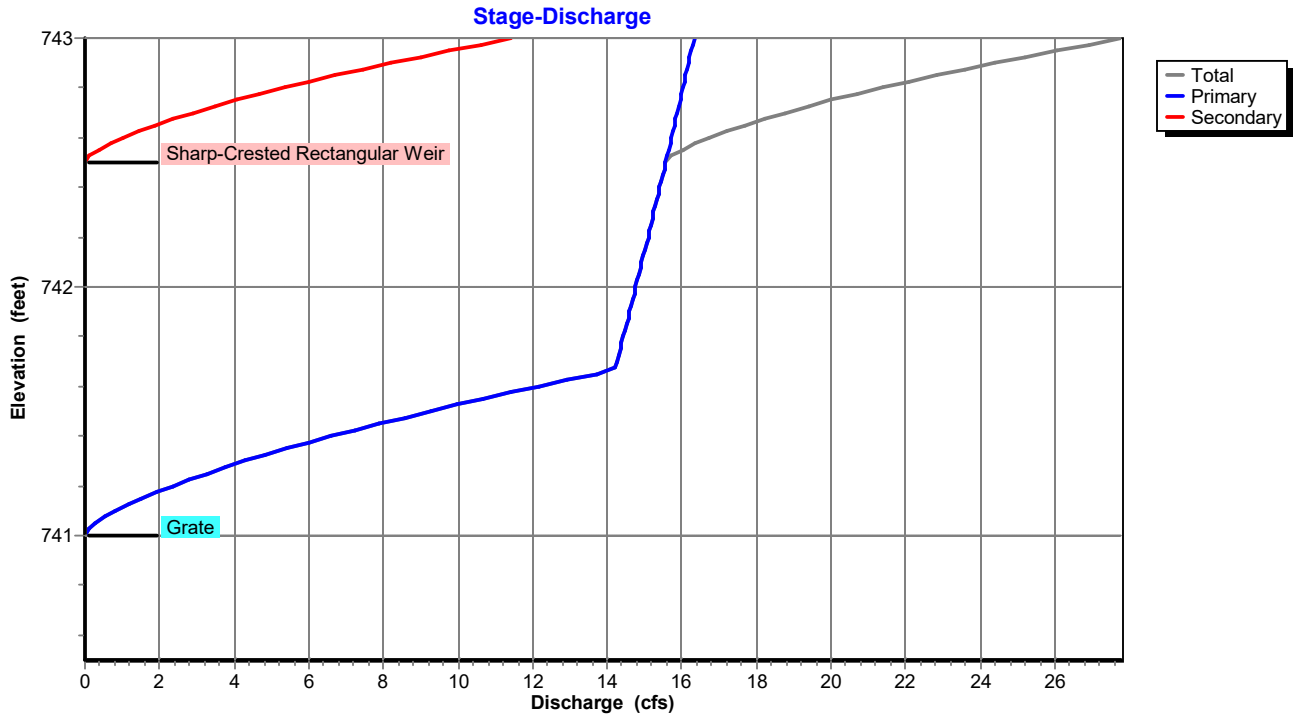
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Proposed Conditions - III
Type II 24-hr 100-yr Rainfall=5.27"

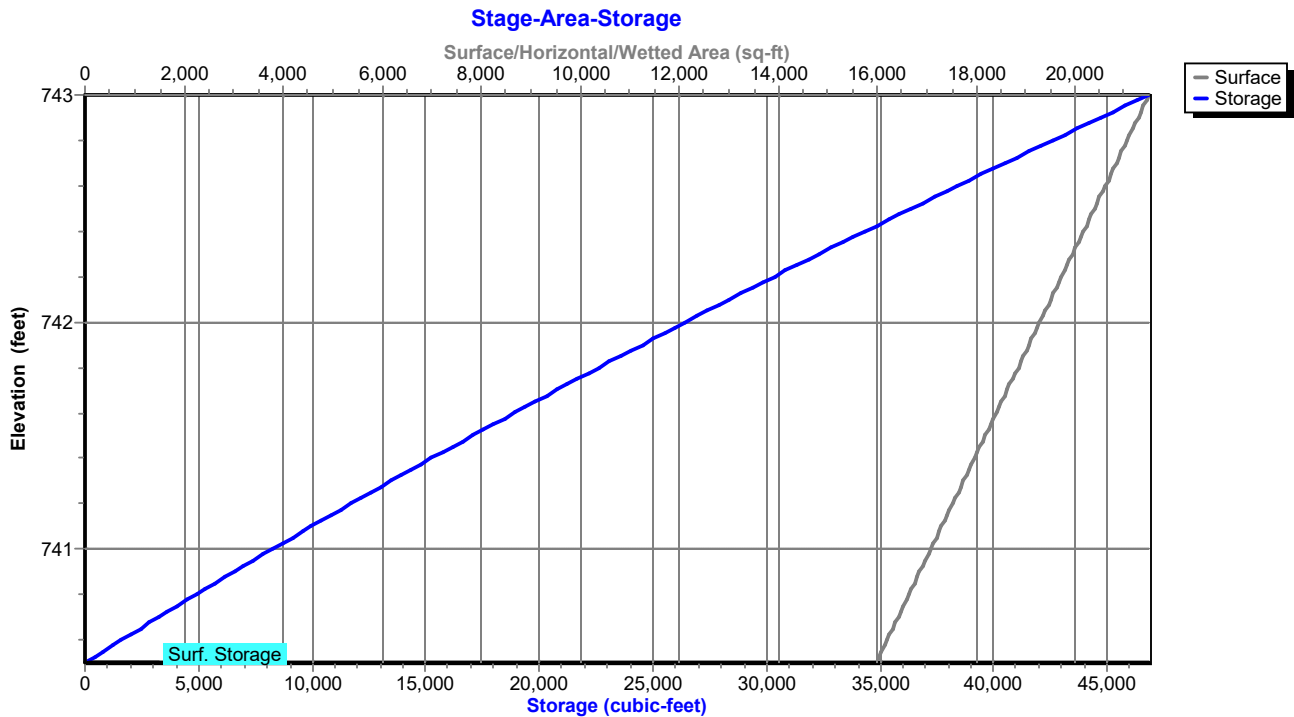
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Pond B-5: Bioretention B-5



Pond B-5: Bioretention B-5



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Stage-Discharge for Pond B-5: Bioretention B-5

| Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) |
|---------------------|--------------------|------------------|--------------------|
| 740.50 | 0.00 | 0.00 | 0.00 |
| 740.55 | 0.00 | 0.00 | 0.00 |
| 740.60 | 0.00 | 0.00 | 0.00 |
| 740.65 | 0.00 | 0.00 | 0.00 |
| 740.70 | 0.00 | 0.00 | 0.00 |
| 740.75 | 0.00 | 0.00 | 0.00 |
| 740.80 | 0.00 | 0.00 | 0.00 |
| 740.85 | 0.00 | 0.00 | 0.00 |
| 740.90 | 0.00 | 0.00 | 0.00 |
| 740.95 | 0.00 | 0.00 | 0.00 |
| 741.00 | 0.00 | 0.00 | 0.00 |
| 741.05 | 0.29 | 0.29 | 0.00 |
| 741.10 | 0.83 | 0.83 | 0.00 |
| 741.15 | 1.52 | 1.52 | 0.00 |
| 741.20 | 2.34 | 2.34 | 0.00 |
| 741.25 | 3.27 | 3.27 | 0.00 |
| 741.30 | 4.30 | 4.30 | 0.00 |
| 741.35 | 5.42 | 5.42 | 0.00 |
| 741.40 | 6.62 | 6.62 | 0.00 |
| 741.45 | 7.90 | 7.90 | 0.00 |
| 741.50 | 9.25 | 9.25 | 0.00 |
| 741.55 | 10.67 | 10.67 | 0.00 |
| 741.60 | 12.16 | 12.16 | 0.00 |
| 741.65 | 13.71 | 13.71 | 0.00 |
| 741.70 | 14.27 | 14.27 | 0.00 |
| 741.75 | 14.35 | 14.35 | 0.00 |
| 741.80 | 14.44 | 14.44 | 0.00 |
| 741.85 | 14.52 | 14.52 | 0.00 |
| 741.90 | 14.60 | 14.60 | 0.00 |
| 741.95 | 14.69 | 14.69 | 0.00 |
| 742.00 | 14.77 | 14.77 | 0.00 |
| 742.05 | 14.85 | 14.85 | 0.00 |
| 742.10 | 14.93 | 14.93 | 0.00 |
| 742.15 | 15.01 | 15.01 | 0.00 |
| 742.20 | 15.09 | 15.09 | 0.00 |
| 742.25 | 15.17 | 15.17 | 0.00 |
| 742.30 | 15.25 | 15.25 | 0.00 |
| 742.35 | 15.33 | 15.33 | 0.00 |
| 742.40 | 15.41 | 15.41 | 0.00 |
| 742.45 | 15.49 | 15.49 | 0.00 |
| 742.50 | 15.57 | 15.57 | 0.00 |
| 742.55 | 16.01 | 15.65 | 0.37 |
| 742.60 | 16.75 | 15.72 | 1.03 |
| 742.65 | 17.69 | 15.80 | 1.89 |
| 742.70 | 18.79 | 15.88 | 2.91 |
| 742.75 | 20.02 | 15.95 | 4.07 |
| 742.80 | 21.37 | 16.03 | 5.34 |
| 742.85 | 22.83 | 16.10 | 6.72 |
| 742.90 | 24.38 | 16.18 | 8.21 |
| 742.95 | 26.04 | 16.25 | 9.78 |
| 743.00 | 27.77 | 16.33 | 11.45 |

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Stage-Area-Storage for Pond B-5: Bioretention B-5

| Elevation (feet) | Surface (sq-ft) | Storage (cubic-feet) |
|---------------------|--------------------|-------------------------|
| 740.50 | 15,980 | 0 |
| 740.55 | 16,090 | 802 |
| 740.60 | 16,200 | 1,609 |
| 740.65 | 16,311 | 2,422 |
| 740.70 | 16,421 | 3,240 |
| 740.75 | 16,531 | 4,064 |
| 740.80 | 16,641 | 4,893 |
| 740.85 | 16,751 | 5,728 |
| 740.90 | 16,862 | 6,568 |
| 740.95 | 16,972 | 7,414 |
| 741.00 | 17,082 | 8,266 |
| 741.05 | 17,192 | 9,122 |
| 741.10 | 17,302 | 9,985 |
| 741.15 | 17,413 | 10,853 |
| 741.20 | 17,523 | 11,726 |
| 741.25 | 17,633 | 12,605 |
| 741.30 | 17,743 | 13,489 |
| 741.35 | 17,853 | 14,379 |
| 741.40 | 17,964 | 15,275 |
| 741.45 | 18,074 | 16,176 |
| 741.50 | 18,184 | 17,082 |
| 741.55 | 18,294 | 17,994 |
| 741.60 | 18,404 | 18,911 |
| 741.65 | 18,515 | 19,834 |
| 741.70 | 18,625 | 20,763 |
| 741.75 | 18,735 | 21,697 |
| 741.80 | 18,845 | 22,636 |
| 741.85 | 18,955 | 23,581 |
| 741.90 | 19,066 | 24,532 |
| 741.95 | 19,176 | 25,488 |
| 742.00 | 19,286 | 26,450 |
| 742.05 | 19,396 | 27,417 |
| 742.10 | 19,506 | 28,389 |
| 742.15 | 19,617 | 29,367 |
| 742.20 | 19,727 | 30,351 |
| 742.25 | 19,837 | 31,340 |
| 742.30 | 19,947 | 32,334 |
| 742.35 | 20,057 | 33,335 |
| 742.40 | 20,168 | 34,340 |
| 742.45 | 20,278 | 35,351 |
| 742.50 | 20,388 | 36,368 |
| 742.55 | 20,498 | 37,390 |
| 742.60 | 20,608 | 38,418 |
| 742.65 | 20,719 | 39,451 |
| 742.70 | 20,829 | 40,490 |
| 742.75 | 20,939 | 41,534 |
| 742.80 | 21,049 | 42,584 |
| 742.85 | 21,159 | 43,639 |
| 742.90 | 21,270 | 44,700 |
| 742.95 | 21,380 | 45,766 |
| 743.00 | 21,490 | 46,838 |

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Proposed Conditions - III
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Summary for Pond P-2: Wet Pond P-2

Inflow Area = 17.240 ac, 69.47% Impervious, Inflow Depth = 4.29" for 100-yr event
 Inflow = 116.26 cfs @ 11.96 hrs, Volume= 6.161 af
 Outflow = 13.66 cfs @ 12.19 hrs, Volume= 6.050 af, Atten= 88%, Lag= 13.4 min
 Primary = 12.57 cfs @ 12.19 hrs, Volume= 6.029 af
 Secondary = 1.08 cfs @ 12.19 hrs, Volume= 0.020 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs
 Peak Elev= 740.07' @ 12.19 hrs Surf.Area= 61,080 sf Storage= 136,630 cf

Plug-Flow detention time= 478.7 min calculated for 6.050 af (98% of inflow)
 Center-of-Mass det. time= 466.8 min (1,267.9 - 801.1)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|--|
| #1 | 730.00' | 0 cf | Retention (Irregular) Listed below (Recalc) 46,278 cf Overall x 0.0% Voids |
| #2 | 736.00' | 177,873 cf | Detention (Irregular) Listed below (Recalc) |
| | | 177,873 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---------------------|----------------------|------------------|---------------------------|---------------------------|---------------------|
| 730.00 | 3,490 | 498.0 | 0 | 0 | 3,490 |
| 734.50 | 8,488 | 612.0 | 26,131 | 26,131 | 13,865 |
| 736.00 | 19,080 | 800.0 | 20,147 | 46,278 | 35,016 |

| Elevation (feet) | Surf.Area (sq-ft) | Perim. (feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---------------------|----------------------|------------------|---------------------------|---------------------------|---------------------|
| 736.00 | 25,870 | 957.0 | 0 | 0 | 25,870 |
| 741.00 | 46,260 | 1,082.0 | 177,873 | 177,873 | 46,783 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|--|
| #1 | Primary | 736.00' | 24.0" Round Culvert L= 220.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 736.00' / 735.17' S= 0.0038 '/ Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 3.14 sf |
| #2 | Device 1 | 738.75' | 24.0" W x 24.0" H 9° Grate C= 0.600 Limited to weir flow at low heads |
| #3 | Secondary | 740.00' | 20.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) |
| #4 | Device 1 | 736.00' | 4.0" Round Culvert-Low Flow L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 735.00' / 736.00' S= -0.0667 '/ Cc= 0.900 n= 0.012, Flow Area= 0.09 sf |
| #5 | Device 1 | 737.65' | 18.0" W x 6.0" H Vert. Orifice-High C= 0.600 Limited to weir flow at low heads |

Proposed Conditions III

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Proposed Conditions - III
Type II 24-hr 100-yr Rainfall=5.27"

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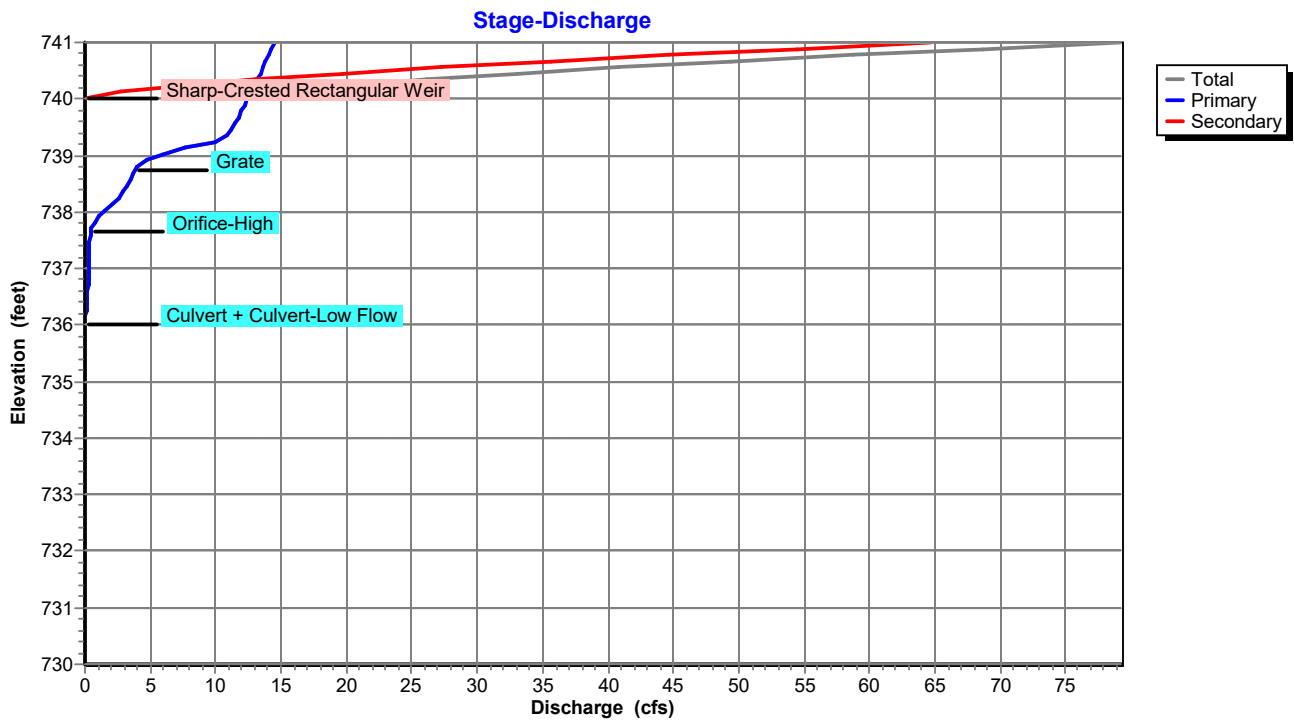
Primary OutFlow Max=12.57 cfs @ 12.19 hrs HW=740.06' TW=0.00' (Dynamic Tailwater)

- 1=Culvert (Barrel Controls 12.57 cfs @ 4.00 fps)
- 2=Grate (Passes < 20.71 cfs potential flow)
- 4=Culvert-Low Flow (Passes < 0.65 cfs potential flow)
- 5=Orifice-High (Passes < 5.31 cfs potential flow)

Secondary OutFlow Max=1.06 cfs @ 12.19 hrs HW=740.06' TW=0.00' (Dynamic Tailwater)

- 3=Sharp-Crested Rectangular Weir (Weir Controls 1.06 cfs @ 0.83 fps)

Pond P-2: Wet Pond P-2



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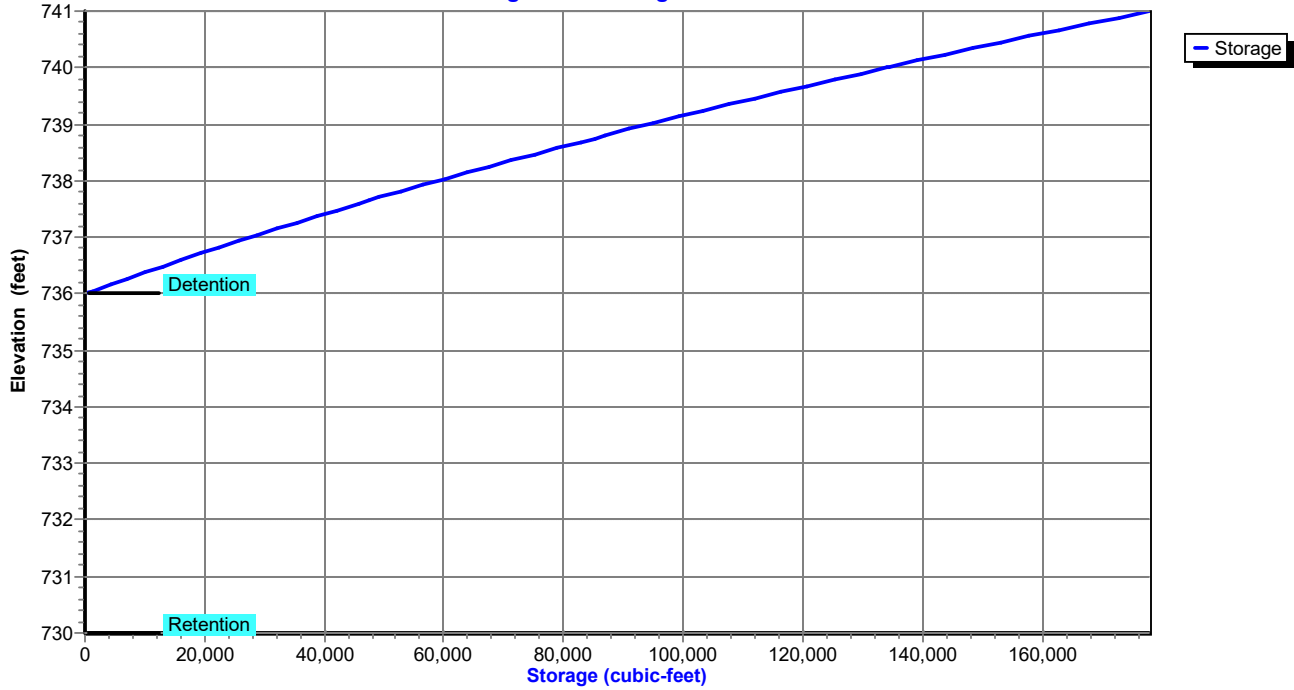
Proposed Conditions - III
Type II 24-hr 100-yr Rainfall=5.27"

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Pond P-2: Wet Pond P-2

Stage-Area-Storage



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Type II 24-hr 100-yr Rainfall=5.27"

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Stage-Discharge for Pond P-2: Wet Pond P-2

| Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) | Elevation (feet) | Discharge (cfs) | Primary (cfs) | Secondary (cfs) |
|---------------------|--------------------|------------------|--------------------|---------------------|--------------------|------------------|--------------------|
| 730.00 | 0.00 | 0.00 | 0.00 | 737.65 | 0.40 | 0.40 | 0.00 |
| 730.15 | 0.00 | 0.00 | 0.00 | 737.80 | 0.70 | 0.70 | 0.00 |
| 730.30 | 0.00 | 0.00 | 0.00 | 737.95 | 1.23 | 1.23 | 0.00 |
| 730.45 | 0.00 | 0.00 | 0.00 | 738.10 | 1.91 | 1.91 | 0.00 |
| 730.60 | 0.00 | 0.00 | 0.00 | 738.25 | 2.56 | 2.56 | 0.00 |
| 730.75 | 0.00 | 0.00 | 0.00 | 738.40 | 3.02 | 3.02 | 0.00 |
| 730.90 | 0.00 | 0.00 | 0.00 | 738.55 | 3.41 | 3.41 | 0.00 |
| 731.05 | 0.00 | 0.00 | 0.00 | 738.70 | 3.74 | 3.74 | 0.00 |
| 731.20 | 0.00 | 0.00 | 0.00 | 738.85 | 4.31 | 4.31 | 0.00 |
| 731.35 | 0.00 | 0.00 | 0.00 | 739.00 | 5.65 | 5.65 | 0.00 |
| 731.50 | 0.00 | 0.00 | 0.00 | 739.15 | 8.00 | 8.00 | 0.00 |
| 731.65 | 0.00 | 0.00 | 0.00 | 739.30 | 10.78 | 10.78 | 0.00 |
| 731.80 | 0.00 | 0.00 | 0.00 | 739.45 | 11.16 | 11.16 | 0.00 |
| 731.95 | 0.00 | 0.00 | 0.00 | 739.60 | 11.52 | 11.52 | 0.00 |
| 732.10 | 0.00 | 0.00 | 0.00 | 739.75 | 11.87 | 11.87 | 0.00 |
| 732.25 | 0.00 | 0.00 | 0.00 | 739.90 | 12.21 | 12.21 | 0.00 |
| 732.40 | 0.00 | 0.00 | 0.00 | 740.05 | 13.27 | 12.54 | 0.73 |
| 732.55 | 0.00 | 0.00 | 0.00 | 740.20 | 18.70 | 12.86 | 5.84 |
| 732.70 | 0.00 | 0.00 | 0.00 | 740.35 | 26.67 | 13.18 | 13.49 |
| 732.85 | 0.00 | 0.00 | 0.00 | 740.50 | 36.49 | 13.48 | 23.01 |
| 733.00 | 0.00 | 0.00 | 0.00 | 740.65 | 47.83 | 13.78 | 34.05 |
| 733.15 | 0.00 | 0.00 | 0.00 | 740.80 | 60.50 | 14.08 | 46.42 |
| 733.30 | 0.00 | 0.00 | 0.00 | 740.95 | 74.35 | 14.37 | 59.98 |
| 733.45 | 0.00 | 0.00 | 0.00 | | | | |
| 733.60 | 0.00 | 0.00 | 0.00 | | | | |
| 733.75 | 0.00 | 0.00 | 0.00 | | | | |
| 733.90 | 0.00 | 0.00 | 0.00 | | | | |
| 734.05 | 0.00 | 0.00 | 0.00 | | | | |
| 734.20 | 0.00 | 0.00 | 0.00 | | | | |
| 734.35 | 0.00 | 0.00 | 0.00 | | | | |
| 734.50 | 0.00 | 0.00 | 0.00 | | | | |
| 734.65 | 0.00 | 0.00 | 0.00 | | | | |
| 734.80 | 0.00 | 0.00 | 0.00 | | | | |
| 734.95 | 0.00 | 0.00 | 0.00 | | | | |
| 735.10 | 0.00 | 0.00 | 0.00 | | | | |
| 735.25 | 0.00 | 0.00 | 0.00 | | | | |
| 735.40 | 0.00 | 0.00 | 0.00 | | | | |
| 735.55 | 0.00 | 0.00 | 0.00 | | | | |
| 735.70 | 0.00 | 0.00 | 0.00 | | | | |
| 735.85 | 0.00 | 0.00 | 0.00 | | | | |
| 736.00 | 0.00 | 0.00 | 0.00 | | | | |
| 736.15 | 0.04 | 0.04 | 0.00 | | | | |
| 736.30 | 0.12 | 0.12 | 0.00 | | | | |
| 736.45 | 0.18 | 0.18 | 0.00 | | | | |
| 736.60 | 0.22 | 0.22 | 0.00 | | | | |
| 736.75 | 0.25 | 0.25 | 0.00 | | | | |
| 736.90 | 0.28 | 0.28 | 0.00 | | | | |
| 737.05 | 0.31 | 0.31 | 0.00 | | | | |
| 737.20 | 0.34 | 0.34 | 0.00 | | | | |
| 737.35 | 0.36 | 0.36 | 0.00 | | | | |
| 737.50 | 0.38 | 0.38 | 0.00 | | | | |

Proposed Conditions III

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Proposed Conditions - III
Type II 24-hr 100-yr Rainfall=5.27"

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Stage-Area-Storage for Pond P-2: Wet Pond P-2

| Elevation (feet) | Storage (cubic-feet) | Elevation (feet) | Storage (cubic-feet) |
|---------------------|-------------------------|---------------------|-------------------------|
| 730.00 | 0 | 737.65 | 47,612 |
| 730.15 | 0 | 737.80 | 52,448 |
| 730.30 | 0 | 737.95 | 57,372 |
| 730.45 | 0 | 738.10 | 62,385 |
| 730.60 | 0 | 738.25 | 67,487 |
| 730.75 | 0 | 738.40 | 72,680 |
| 730.90 | 0 | 738.55 | 77,965 |
| 731.05 | 0 | 738.70 | 83,341 |
| 731.20 | 0 | 738.85 | 88,810 |
| 731.35 | 0 | 739.00 | 94,372 |
| 731.50 | 0 | 739.15 | 100,029 |
| 731.65 | 0 | 739.30 | 105,782 |
| 731.80 | 0 | 739.45 | 111,630 |
| 731.95 | 0 | 739.60 | 117,575 |
| 732.10 | 0 | 739.75 | 123,617 |
| 732.25 | 0 | 739.90 | 129,758 |
| 732.40 | 0 | 740.05 | 135,998 |
| 732.55 | 0 | 740.20 | 142,339 |
| 732.70 | 0 | 740.35 | 148,779 |
| 732.85 | 0 | 740.50 | 155,322 |
| 733.00 | 0 | 740.65 | 161,967 |
| 733.15 | 0 | 740.80 | 168,714 |
| 733.30 | 0 | 740.95 | 175,566 |
| 733.45 | 0 | | |
| 733.60 | 0 | | |
| 733.75 | 0 | | |
| 733.90 | 0 | | |
| 734.05 | 0 | | |
| 734.20 | 0 | | |
| 734.35 | 0 | | |
| 734.50 | 0 | | |
| 734.65 | 0 | | |
| 734.80 | 0 | | |
| 734.95 | 0 | | |
| 735.10 | 0 | | |
| 735.25 | 0 | | |
| 735.40 | 0 | | |
| 735.55 | 0 | | |
| 735.70 | 0 | | |
| 735.85 | 0 | | |
| 736.00 | 0 | | |
| 736.15 | 3,920 | | |
| 736.30 | 7,919 | | |
| 736.45 | 11,998 | | |
| 736.60 | 16,159 | | |
| 736.75 | 20,401 | | |
| 736.90 | 24,725 | | |
| 737.05 | 29,133 | | |
| 737.20 | 33,624 | | |
| 737.35 | 38,201 | | |
| 737.50 | 42,863 | | |

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Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Link 3AR-I: 3A Reach

Inflow Area = 17.240 ac, 69.47% Impervious, Inflow Depth > 4.20" for 100-yr event
Inflow = 12.57 cfs @ 12.19 hrs, Volume= 6.029 af
Primary = 12.57 cfs @ 12.26 hrs, Volume= 6.029 af, Atten= 0%, Lag= 4.2 min

Primary outflow = Inflow delayed by 3.6 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - III
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Link 3AR-II: 3A Reach

Inflow Area = 48.574 ac, 49.82% Impervious, Inflow Depth > 3.96" for 100-yr event
Inflow = 98.15 cfs @ 12.35 hrs, Volume= 16.009 af
Primary = 97.88 cfs @ 12.37 hrs, Volume= 16.009 af, Atten= 0%, Lag= 1.6 min

Primary outflow = Inflow delayed by 1.6 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - III
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Link 3AT: DA #3A Total

Inflow Area = 48.574 ac, 49.82% Impervious, Inflow Depth > 3.96" for 100-yr event
Inflow = 98.15 cfs @ 12.35 hrs, Volume= 16.009 af
Primary = 98.15 cfs @ 12.35 hrs, Volume= 16.009 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - III
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Link 3BP: Bypass

Inflow Area = 14.938 ac, 77.61% Impervious, Inflow Depth = 4.57" for 100-yr event
Inflow = 105.36 cfs @ 11.96 hrs, Volume= 5.695 af
Primary = 14.30 cfs @ 11.65 hrs, Volume= 3.923 af, Atten= 86%, Lag= 0.0 min
Secondary = 91.06 cfs @ 11.96 hrs, Volume= 1.771 af

Primary outflow = Inflow below 14.30 cfs, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

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Proposed Conditions - III
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Link 3BR: 3B Reach

Inflow Area = 7.407 ac, 19.33% Impervious, Inflow Depth = 3.55" for 100-yr event
Inflow = 29.10 cfs @ 12.14 hrs, Volume= 2.192 af
Primary = 28.81 cfs @ 12.28 hrs, Volume= 2.192 af, Atten= 1%, Lag= 8.5 min

Primary outflow = Inflow delayed by 8.5 min, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

Proposed Conditions III

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Proposed Conditions - III
Type II 24-hr 100-yr Rainfall=5.27"

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Summary for Link DP-3: DP #3 - Rush Crk

Inflow Area = 55.981 ac, 45.79% Impervious, Inflow Depth > 3.90" for 100-yr event
Inflow = 123.65 cfs @ 12.33 hrs, Volume= 18.201 af
Primary = 123.65 cfs @ 12.33 hrs, Volume= 18.201 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-80.00 hrs, dt= 0.05 hrs

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

| | |
|------------------|---------------------------------|
| Smoothing | No |
| State | New York |
| Location | |
| Longitude | 78.786 degrees West |
| Latitude | 42.772 degrees North |
| Elevation | 0 feet |
| Date/Time | Thu, 26 May 2022 11:42:47 -0400 |

Extreme Precipitation Estimates

| | 5min | 10min | 15min | 30min | 60min | 120min | | 1hr | 2hr | 3hr | 6hr | 12hr | 24hr | 48hr | | 1day | 2day | 4day | 7day | 10day | |
|--------------|------|-------|-------|-------|-------|--------|--------------|------|------|------|------|------|------|------|--------------|------|------|------|-------|-------|--------------|
| 1yr | 0.27 | 0.42 | 0.51 | 0.68 | 0.84 | 0.97 | 1yr | 0.73 | 0.95 | 1.08 | 1.28 | 1.57 | 1.84 | 2.19 | 1yr | 1.63 | 2.10 | 2.55 | 3.07 | 3.56 | 1yr |
| 2yr | 0.31 | 0.48 | 0.60 | 0.81 | 0.99 | 1.15 | 2yr | 0.86 | 1.12 | 1.27 | 1.54 | 1.83 | 2.20 | 2.53 | 2yr | 1.95 | 2.44 | 2.89 | 3.45 | 3.96 | 2yr |
| 5yr | 0.37 | 0.57 | 0.71 | 0.97 | 1.24 | 1.43 | 5yr | 1.07 | 1.40 | 1.58 | 1.91 | 2.28 | 2.70 | 3.10 | 5yr | 2.39 | 2.98 | 3.49 | 4.13 | 4.74 | 5yr |
| 10yr | 0.43 | 0.65 | 0.81 | 1.13 | 1.46 | 1.70 | 10yr | 1.26 | 1.66 | 1.87 | 2.25 | 2.70 | 3.15 | 3.60 | 10yr | 2.79 | 3.47 | 4.03 | 4.73 | 5.44 | 10yr |
| 25yr | 0.51 | 0.78 | 0.97 | 1.39 | 1.83 | 2.13 | 25yr | 1.58 | 2.09 | 2.35 | 2.81 | 3.37 | 3.87 | 4.41 | 25yr | 3.42 | 4.24 | 4.87 | 5.65 | 6.52 | 25yr |
| 50yr | 0.59 | 0.90 | 1.12 | 1.61 | 2.16 | 2.53 | 50yr | 1.87 | 2.48 | 2.78 | 3.31 | 3.99 | 4.51 | 5.13 | 50yr | 3.99 | 4.93 | 5.62 | 6.48 | 7.49 | 50yr |
| 100yr | 0.68 | 1.03 | 1.29 | 1.87 | 2.56 | 3.01 | 100yr | 2.21 | 2.95 | 3.31 | 3.92 | 4.73 | 5.27 | 5.98 | 100yr | 4.67 | 5.75 | 6.49 | 7.42 | 8.60 | 100yr |
| 200yr | 0.79 | 1.19 | 1.50 | 2.18 | 3.04 | 3.58 | 200yr | 2.62 | 3.50 | 3.94 | 4.63 | 5.60 | 6.17 | 6.96 | 200yr | 5.46 | 6.70 | 7.49 | 8.51 | 9.88 | 200yr |
| 500yr | 0.97 | 1.43 | 1.85 | 2.68 | 3.81 | 4.51 | 500yr | 3.29 | 4.41 | 4.97 | 5.80 | 7.02 | 7.58 | 8.53 | 500yr | 6.71 | 8.20 | 9.08 | 10.20 | 11.87 | 500yr |

Lower Confidence Limits

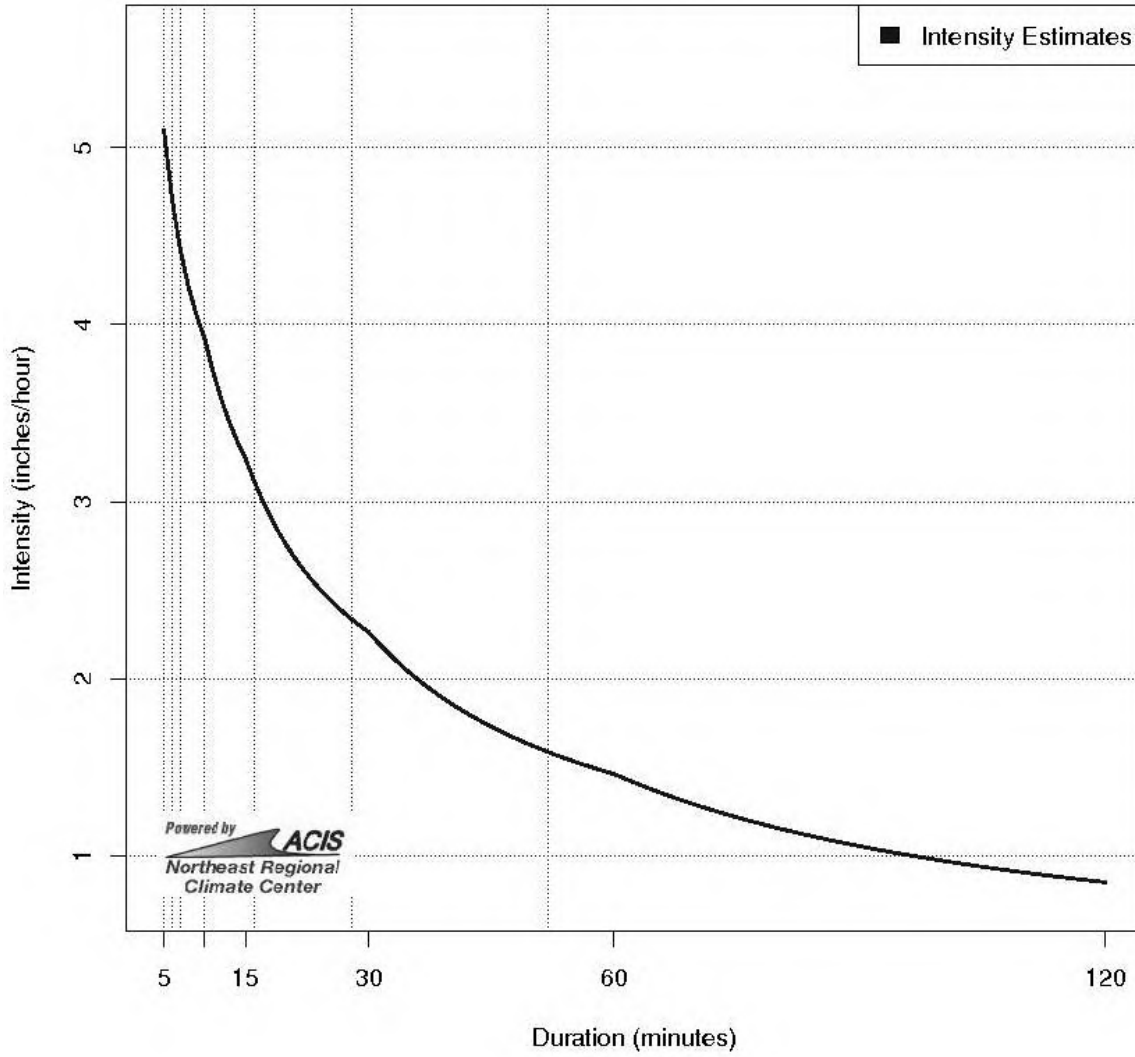
| | 5min | 10min | 15min | 30min | 60min | 120min | | 1hr | 2hr | 3hr | 6hr | 12hr | 24hr | 48hr | | 1day | 2day | 4day | 7day | 10day | |
|--------------|------|-------|-------|-------|-------|--------|--------------|------|------|------|------|------|------|------|--------------|------|------|------|------|-------|--------------|
| 1yr | 0.23 | 0.36 | 0.44 | 0.60 | 0.73 | 0.80 | 1yr | 0.63 | 0.78 | 0.87 | 1.10 | 1.43 | 1.62 | 1.96 | 1yr | 1.43 | 1.88 | 2.32 | 2.90 | 3.36 | 1yr |
| 2yr | 0.30 | 0.46 | 0.57 | 0.77 | 0.96 | 1.10 | 2yr | 0.82 | 1.08 | 1.21 | 1.47 | 1.75 | 2.14 | 2.48 | 2yr | 1.90 | 2.38 | 2.82 | 3.37 | 3.86 | 2yr |
| 5yr | 0.34 | 0.52 | 0.65 | 0.89 | 1.13 | 1.30 | 5yr | 0.97 | 1.27 | 1.45 | 1.76 | 2.08 | 2.51 | 2.90 | 5yr | 2.23 | 2.79 | 3.28 | 3.88 | 4.46 | 5yr |
| 10yr | 0.37 | 0.57 | 0.71 | 0.99 | 1.28 | 1.44 | 10yr | 1.10 | 1.41 | 1.66 | 1.99 | 2.34 | 2.82 | 3.26 | 10yr | 2.50 | 3.13 | 3.68 | 4.32 | 4.99 | 10yr |
| 25yr | 0.42 | 0.64 | 0.80 | 1.14 | 1.51 | 1.71 | 25yr | 1.30 | 1.67 | 1.95 | 2.32 | 2.74 | 3.31 | 3.81 | 25yr | 2.93 | 3.67 | 4.26 | 4.99 | 5.80 | 25yr |
| 50yr | 0.46 | 0.71 | 0.88 | 1.26 | 1.70 | 1.92 | 50yr | 1.47 | 1.87 | 2.22 | 2.61 | 3.10 | 3.73 | 4.29 | 50yr | 3.31 | 4.13 | 4.78 | 5.56 | 6.51 | 50yr |
| 100yr | 0.51 | 0.77 | 0.97 | 1.40 | 1.92 | 2.15 | 100yr | 1.66 | 2.10 | 2.53 | 2.95 | 3.49 | 4.20 | 4.83 | 100yr | 3.71 | 4.65 | 5.37 | 6.22 | 7.32 | 100yr |
| 200yr | 0.57 | 0.85 | 1.08 | 1.56 | 2.18 | 2.40 | 200yr | 1.88 | 2.35 | 2.88 | 3.32 | 3.93 | 4.72 | 5.44 | 200yr | 4.18 | 5.24 | 6.02 | 6.97 | 8.24 | 200yr |
| 500yr | 0.65 | 0.97 | 1.24 | 1.81 | 2.57 | 2.77 | 500yr | 2.22 | 2.71 | 3.43 | 3.89 | 4.60 | 5.53 | 6.38 | 500yr | 4.90 | 6.14 | 7.02 | 8.12 | 9.68 | 500yr |

Upper Confidence Limits

| | 5min | 10min | 15min | 30min | 60min | 120min | | 1hr | 2hr | 3hr | 6hr | 12hr | 24hr | 48hr | | 1day | 2day | 4day | 7day | 10day | |
|--------------|------|-------|-------|-------|-------|--------|--------------|------|------|------|------|-------|------|-------|--------------|------|-------|-------|-------|-------|--------------|
| 1yr | 0.31 | 0.47 | 0.58 | 0.78 | 0.95 | 1.09 | 1yr | 0.82 | 1.07 | 1.22 | 1.44 | 1.78 | 2.05 | 2.35 | 1yr | 1.82 | 2.26 | 2.71 | 3.22 | 3.72 | 1yr |
| 2yr | 0.33 | 0.50 | 0.62 | 0.84 | 1.03 | 1.22 | 2yr | 0.89 | 1.20 | 1.33 | 1.62 | 1.91 | 2.28 | 2.64 | 2yr | 2.02 | 2.54 | 2.98 | 3.56 | 4.08 | 2yr |
| 5yr | 0.40 | 0.62 | 0.77 | 1.06 | 1.35 | 1.55 | 5yr | 1.17 | 1.52 | 1.73 | 2.08 | 2.51 | 2.89 | 3.29 | 5yr | 2.56 | 3.16 | 3.69 | 4.38 | 5.05 | 5yr |
| 10yr | 0.48 | 0.74 | 0.92 | 1.28 | 1.66 | 1.90 | 10yr | 1.43 | 1.86 | 2.13 | 2.55 | 3.09 | 3.46 | 3.91 | 10yr | 3.06 | 3.76 | 4.35 | 5.13 | 5.93 | 10yr |
| 25yr | 0.62 | 0.94 | 1.17 | 1.67 | 2.19 | 2.58 | 25yr | 1.89 | 2.52 | 2.81 | 3.34 | 4.08 | 4.41 | 4.93 | 25yr | 3.91 | 4.74 | 5.41 | 6.31 | 7.32 | 25yr |
| 50yr | 0.73 | 1.12 | 1.39 | 2.00 | 2.69 | 3.19 | 50yr | 2.32 | 3.12 | 3.47 | 4.11 | 5.03 | 5.31 | 5.87 | 50yr | 4.70 | 5.65 | 6.38 | 7.36 | 8.59 | 50yr |
| 100yr | 0.88 | 1.33 | 1.67 | 2.41 | 3.31 | 3.95 | 100yr | 2.85 | 3.86 | 4.28 | 5.05 | 6.20 | 6.39 | 6.98 | 100yr | 5.65 | 6.72 | 7.53 | 8.61 | 10.06 | 100yr |
| 200yr | 1.06 | 1.59 | 2.02 | 2.92 | 4.07 | 4.88 | 200yr | 3.51 | 4.77 | 5.28 | 6.21 | 7.62 | 7.70 | 8.31 | 200yr | 6.81 | 7.99 | 8.90 | 10.06 | 11.79 | 200yr |
| 500yr | 1.35 | 2.01 | 2.59 | 3.76 | 5.35 | 6.45 | 500yr | 4.62 | 6.31 | 6.97 | 8.14 | 10.04 | 9.86 | 10.46 | 500yr | 8.72 | 10.06 | 11.07 | 12.36 | 14.52 | 500yr |



Intensity Frequency Duration – 10yr (42.772N, -78.786W)



| Time (mins) | Intensity (in/hr) |
|-------------|-------------------|
| 5 | 5.10 |
| 6* | 4.71 |
| 7* | 4.42 |
| 8* | 4.21 |
| 9* | 4.05 |
| 10 | 3.92 |
| 11* | 3.73 |
| 12* | 3.58 |
| 13* | 3.45 |
| 14* | 3.34 |
| 15 | 3.24 |
| 16* | 3.12 |
| 17* | 3.01 |
| 18* | 2.91 |
| 19* | 2.83 |
| 20* | 2.75 |
| 21* | 2.68 |
| 22* | 2.62 |
| 23* | 2.56 |

| | |
|-----|------|
| 24* | 2.51 |
| 25* | 2.46 |
| 26* | 2.41 |
| 27* | 2.37 |
| 28* | 2.33 |
| 29* | 2.30 |
| 30 | 2.26 |
| 31* | 2.21 |
| 32* | 2.16 |
| 33* | 2.12 |
| 34* | 2.08 |
| 35* | 2.03 |
| 36* | 2.00 |
| 37* | 1.96 |
| 38* | 1.93 |
| 39* | 1.89 |
| 40* | 1.86 |
| 41* | 1.83 |
| 42* | 1.81 |
| 43* | 1.78 |
| 44* | 1.75 |
| 45* | 1.73 |
| 46* | 1.71 |
| 47* | 1.68 |
| 48* | 1.66 |
| 49* | 1.64 |
| 50* | 1.62 |
| 51* | 1.60 |
| 52* | 1.59 |
| 53* | 1.57 |
| 54* | 1.55 |
| 55* | 1.53 |
| 56* | 1.52 |
| 57* | 1.50 |
| 58* | 1.49 |
| 59* | 1.48 |
| 60 | 1.46 |
| 61* | 1.44 |
| 62* | 1.42 |
| 63* | 1.40 |
| 64* | 1.39 |
| 65* | 1.37 |
| 66* | 1.35 |
| 67* | 1.33 |
| 68* | 1.32 |
| 69* | 1.30 |
| 70* | 1.29 |
| 71* | 1.27 |
| 72* | 1.26 |
| 73* | 1.24 |
| 74* | 1.23 |
| 75* | 1.22 |
| 76* | 1.20 |
| 77* | 1.19 |
| 78* | 1.18 |
| 79* | 1.17 |
| 80* | 1.16 |
| 81* | 1.15 |
| 82* | 1.13 |
| 83* | 1.12 |
| 84* | 1.11 |
| 85* | 1.10 |
| 86* | 1.09 |
| 87* | 1.08 |
| 88* | 1.07 |

| | |
|------|------|
| 89* | 1.06 |
| 90* | 1.05 |
| 91* | 1.05 |
| 92* | 1.04 |
| 93* | 1.03 |
| 94* | 1.02 |
| 95* | 1.01 |
| 96* | 1.00 |
| 97* | 1.00 |
| 98* | 0.99 |
| 99* | 0.98 |
| 100* | 0.97 |
| 101* | 0.97 |
| 102* | 0.96 |
| 103* | 0.95 |
| 104* | 0.95 |
| 105* | 0.94 |
| 106* | 0.93 |
| 107* | 0.93 |
| 108* | 0.92 |
| 109* | 0.91 |
| 110* | 0.91 |
| 111* | 0.90 |
| 112* | 0.89 |
| 113* | 0.89 |
| 114* | 0.88 |
| 115* | 0.88 |
| 116* | 0.87 |
| 117* | 0.87 |
| 118* | 0.86 |
| 119* | 0.86 |
| 120 | 0.85 |

*values for noted rows are calculated estimates

APPENDIX E

General Permit for Construction Stormwater Discharges from Construction Activities – GP-0-20-001

APPENDIX F

Operation & Maintenance Manual

Permanent Stormwater Management Facilities; OPERATION & MAINTENANCE (O&M) MANUAL

For: New Bills Stadium

Located At: Towns of Orchard Park & Hamburg
Erie County, New York

Prepared For: Buffalo Bills
1 Bills Drive
Orchard Park, New York 14127

Prepared By: Pinewoods Engineering, PC
42 Aston Villa
N. Chili, NY 14514

I. Compliance with Stormwater Facility Maintenance Requirements

All property owners are responsible for ensuring that stormwater facilities installed on their property are properly maintained and that they function as designed. For the New Bills Stadium, the following entity is responsible for the long-term operation and maintenance of post-development, permanent stormwater management facilities:

| | |
|--------------|--|
| Entity Name: | Buffalo Bills |
| Contact: | Kathryn D'Angelo, Assistance General Counsel |
| Address: | 1 Bills Drive, Orchard Park, NY 14127 |
| Telephone: | (716) 312-8607 |
| E-Mail: | Kathryn.d'angelo@bills.nfl.net |

II. On-Going Preventative Maintenance Measures

On-going preventative maintenance should be done to prevent pollutants from entering facilities in the first place. Common pollutants include: sediment, trash & debris, chemicals, dog wastes, runoff from stored materials, and illicit discharges into the storm drainage system. These pollutants may be prevented from entering the stormwater facility by:

- Keeping the property, street and gutter, and parking lots free of trash, debris and lawn clippings.
- Ensure the proper disposal of hazardous wastes and chemicals.
- Plan lawn care to minimize the use of chemicals and pesticides.
- Sweep paved surfaces and put the sweeping back on the lawn.
- Be aware of leaked automobile fluids. Use absorbents such as cat litter or rags to soak up drippings and properly dispose of.
- Re-vegetate disturbed and bare areas to maintain vegetative stabilization.
- Clean-out the upstream components of the storm drainage system, including inlets, storm sewers and outfalls.
- Avoid storing material outdoors (including landscaping materials) unless properly protected from runoff.

III. Safety Procedures During Facility Inspections

Keep safety considerations at the forefront of inspection procedures at all times. Likely hazards should be anticipated and avoided. Never enter a confined space (ie. Outlet structure, manhole, etc.) without proper training or equipment and at least one additional person present. If a toxic or flammable substance is discovered, leave the immediate area and contact 9-1-1. Vertical drops or steep slopes may be encountered in areas located within and around the facility. Avoid walking on top of retaining walls, outfalls, headwalls or other structures. Maintenance personnel should be qualified to perform this work.

IV. Inspection Stormwater Management Facilities

The quality of stormwater entering the waters of the state relies heavily on the proper operation and maintenance of permanent best management practices. Stormwater management facilities must be

periodically inspected to ensure that they function as designed. The inspection will determine the appropriate maintenance that is required for the facility.

V. Inspection Procedures

All stormwater management facilities are required to be inspected by a qualified individual at a minimum of once per year. A qualified individual is one who is familiar with the site, the facility components and this manual. Inspections should follow the inspection guidance found in the SMDM, Chapter 5 & 6 for the specific type of facility. It is recommended the person conducting the inspection activities complete the appropriate inspection report found in Appendix G of the SMDM for the specific type of facility and that those reports be stored with this manual.

VI. Maintaining Stormwater Management Facilities

Stormwater management facilities require maintenance to ensure that they operate correctly and as designed. Routine maintenance performed on a frequently scheduled basis, can help avoid more costly rehabilitative maintenance. Typically, maintenance is separated into three categories:

- Routine Work – Activities normally performed at numerous and varying times during the year.
- Restorative Work – Small scale maintenance performed to address specific operational problems completed with a small crew using minor tools or small equipment.
- Rehabilitative Work – Large scale maintenance and major improvements to address failures. May required an engineering design with construction plans and jurisdictional review and approval.

VII. Facility Specific Standard Operation Procedures for Inspection & Maintenance

A. Stormwater Management Pond

Features:

- Forebay – shallow micro-pool located at the inflow point(s) of the basin. Typically, this is designed to be submerged below the permanent water surface elevation.
- Deep Pool – separated by a barrier from the forebay, a deeper micro-pool located at the outflow point(s). Typically, this is designed to be submerged below the permanent water surface elevation.
- Outlet Structure – This consists of a grated-top catch basin, with an inflow pipe(s) from the pond and sometimes orifices or weirs on the pond side and a pipe outlet (discharge) away from the pond.
- Emergency Spillway – This consists of a rip-rap covered weir typically at the top of the pond for overflow discharges.

Typical Maintenance Matrix

| Maintenance Activity: Component: | Sediment Removal/ Outlet Cleaning | Mowing/ Weed Control | Trash & Debris Removal | Erosion/ Rutting/ Bare Earth | Overgrown Vegetation Removal | Standing Water/ Pests/Algae Control | Structure Repair |
|--|--------------------------------------|-------------------------|---------------------------|------------------------------------|------------------------------------|--|---------------------|
| Inflow Points | X | | X | X | X | | X |
| Forebay | X | | X | | X | X | |
| Spillway/Channel Between Forebay & Deep Pool | X | | X | X | X | X | X |
| Deep Pool | X | | X | | X | X | |
| Outlet Structure | X | | X | | X | | X |
| Emergency Spillway | | | X | X | X | | X |
| Inside Pond Banks | | | X | X | X | | |
| Outside Embankment | | X | | X | X | | |

Routine Maintenance Activities:

▪ **Mowing**

Frequency: Twice Annually, or as needed

Mow occasionally to limit unwanted vegetation and to improve the overall appearance. Native vegetation should be mowed to a height of 4-6 inches tall. Grass clippings should be collected and disposed of properly.

▪ **Trash/Debris Removal**

Frequency: Twice Annually, or as needed, performed prior to mowing operations.

Trash and debris should be removed from the facility to minimize outlet clogging and to improve aesthetics. This activity should be performed prior to mowing operations.

▪ **Outlet Works Cleaning**

Frequency: Routine – after significant rainfall events or concurrently with other maintenance activities.

Debris and other materials can clog the outlet structures grate, trash rack, and orifice and weir openings. This activity must be performed anytime other maintenance activities are conducted to ensure proper operation.

▪ **Weed Control**

Frequency: Routine – As needed based on inspection

Noxious weeds and other unwanted or overgrown vegetation must be treated as needed. This activity is typically performed through mechanical means (mowing/pulling).

▪ **Mosquito/Pests/Algae Treatment**

Frequency: As needed

Treatment of permanent pools to control mosquitoes and undesirable pests or aquatic vegetation that can create nuisances. Contact NYSDEC for guidance on how to mitigate the specific nuisance.

Minor Maintenance Activities:

▪ **Sediment Removal**

Frequency: As needed based on inspection, typically every 1-2 years.

Sediment removal is necessary to maintain the original design volume and function of the facility.

Minor sediment removal can typically be addressed with shovels and smaller equipment.

Removed sediments do not meet the criteria of “hazardous waste” however, these sediments are contaminated with a wide array of organic and inorganic pollutants and must be handled with care. Sediment should be carefully removed during dry weather to prevent turbidity, further sedimentation or adverse water quality impacts. Removed sediments should be dewatered and then transported by vehicle to a proper disposal site (ie. Landfill, etc.). If necessary, restabilize any bare areas.

▪ **Erosion Repair**

Frequency: As needed based on inspection

Erosion can vary in magnitude from minor repairs to embankment ruts, energy dissipaters and rilling to major bullies in the embankments and spillways. The repair of eroded areas may require the use of excavators, earthmoving equipment, riprap and erosion control blankets. All areas should be repaired in-kind and fully stabilized.

▪ **Vegetation Removal/Tree Thinning**

Frequency: As necessary based on inspection

Dense stands of woody vegetation or trees can create maintenance problems within the facility.

Tree roots can damage structures and invade pipes/channels thereby blocking flows. Trees growing in the basin will most likely have to be moved when sediment/dredging operations occur. All trees growing near inflows, outlet structure, emergency spillways or on embankments should be removed.

▪ **Clearing Pond Drains, Orifices and Outflows**

Frequency: As necessary based on inspection

The facility contains many structures, openings and pipes that can be frequently clogged with debris.

These blockages can result in a decrease in the hydraulic capacity and standing water elevation in the basin. Specialized equipment or qualified personnel may be required to clear debris from this structure.

Major Maintenance Activities:

These typically involve: large quantities of sediment removal, severe erosion involving; gullies, excessive soil displacement, settlement or holes, and structural repairs to damaged items. These maintenance activities should be performed as a frequency as needed based on inspections.

These activities may require an engineer design or jurisdictional approval. Consult appropriate authorities before proceeding with these activities.

B. Bioretention Facility

Features:

- Stilling Basin – a shallow micro-pool located at the inflow point(s) of the basin designed to provide pre-treatment. Typically, this pool is designed to have permanent standing water.
- Infiltration Bed – this is a flat area which typically consists of specific plant materials and mulch. This surface area is designed to allow for slow infiltration to subsurface layers.
- Amended Planting Soil – This is a subsurface layer under the infiltration bed that contains amended planting soil meeting certain specifications and containing void space for detention storage. This layer is designed to allow for slow infiltration to the lower layer.
- Gravel Layer – This is a subsurface layer below the Amended Planting Soil layer that contain gravel and an underdrain. The gravel provides void space for detention storage. Where native soils allow, this layer is designed to infiltrate stored runoff. Runoff not infiltrated is collected in the underdrain.
- Underdrain – Located in the gravel layer, this consists a very moderately sloped perforated pipe designed to capture runoff which will not be infiltrated and convey it to the discharge pipe.
- Outlet Structure – This consists of a grated outlet structure which is elevated approximately 6- inches above the infiltration bed and designed to pass larger storm events. It typically consists of a surface grate, serves as a connection point for underdrain, and has a pipe outlet (discharge) away from the practice.
- Emergency Spillway – This consists of a rip-rap covered weir typically at the top of the practice for overflow discharges.

Typical Maintenance Matrix

| Maintenance Activity: | Sediment Removal/ Outlet Cleaning | Mowing/ Weed Control | Trash & Debris Removal | Erosion/ Rutting/ Bare Earth | Overgrown Vegetation Removal | Standing Water/ Pests/Algae Control | Structure Repair |
|---------------------------------|--|-----------------------------|-----------------------------------|-------------------------------------|-------------------------------------|--|-------------------------|
| Component: Inflow Points | X | | X | X | | | X |
| Stilling Basin | X | X | X | X | X | X | |
| Infiltration Bed | X | X | X | X | X | X | |
| Amended Planting Soil Layer | | | | | | | |
| Gravel Layer | | | | | | | |
| Underdrain | X | | | | | | |
| Outlet Structure | X | | X | | | | X |
| Emergency Spillway | X | | X | | | | X |
| Inside Facility Banks | | X | X | X | X | | |
| Outside Embankment | | X | X | X | X | | |

Routine Maintenance Activities:

▪ **Mowing**

Frequency: Twice Annually, or as needed

Mow occasionally to limit unwanted vegetation and to improve the overall appearance. Native vegetation should be mowed to a height of 2-4 inches tall. Grass clippings should be bagged to prevent potential contamination of the filter media.

▪ **Trash/Debris Removal**

Frequency: Twice Annually, or as needed, performed prior to mowing operations.

Trash and debris should be removed from the facility to minimize outlet clogging and to improve aesthetics. This activity should be performed prior to mowing operations.

▪ **Outlet Works Cleaning**

Frequency: Routine – after significant rainfall events or concurrently with other maintenance activities.

Debris, woody growth, and other materials can clog the outlet structures grate. This activity must be performed anytime other maintenance activities are conducted to ensure proper operation.

▪ **Weed Control**

Frequency: Routine – As needed based on inspection

Undesirable vegetation can grow in and around the facility that significantly affect the performance by causing debris/sediment to accumulate, and blocking inflows and damaging the filter media and underdrain system. This includes dense shrubs, grasses and noxious weeds. The landscape elements of the facility should be maintained the same as other landscape areas. Mulch may need to be removed and replaced. Vegetation removal activity is typically performed through mechanical means (mowing/pulling).

▪ **Infiltration Rate Check**

Frequency: Periodically

The infiltration rate of the infiltration bed should be checked in order to ensure proper function. Generally, the facility should drain completely within 12-hours of a storm event. If drain times exceed the 12-hour drain time then maintenance of the filter media may be required.

▪ **Underdrain System Check**

Frequency: Periodically

With proper maintenance of the surface components of the facility, there should be a minimum amount of maintenance required on the underdrain system. Inspection ports or clean-outs may be used to determine if subsurface layers are retaining water.

▪ **Mosquito/Pests/Algae Treatment**

Frequency: As needed

Generally, the pool of standing water is very minor. However, if treatment of permanent pools is required to control mosquitoes and undesirable pests or aquatic vegetation that can create nuisances, contact NYSDEC for guidance on how to mitigate the specific nuisance.

Minor Maintenance Activities:

▪ **Sediment Removal**

Frequency: As needed based on inspection, typically every 1-2 years.

Sediment removal is necessary to ensure proper function of the filter media. Generally the top 3-inches of filter media should be removed at each removal period. Additional amounts of filter media may need to be removed if deeper sections of the filter media are contaminated. New filter media will need to replace the removed filter media. All replaced filter media should meet original facility specifications. Minor sediment removal can typically be addressed with shovels, rakes, and smaller equipment. Extreme care should be taken when utilizing motorized or heavy equipment to ensure damage to the underdrain system or porosity of the subsurface soils does not occur. Removed sediments do not meet the criteria of “hazardous waste” however, these sediments are contaminated with a wide array of organic and inorganic pollutants and must be handled with care. Sediment should be carefully removed during dry weather to prevent turbidity, further sedimentation or adverse water quality impacts. Removed sediments should be dewatered and then transported by vehicle to a proper disposal site (ie. Landfill, etc.). If necessary, restabilize any bare areas.

▪ **Erosion Repair**

Frequency: As needed based on inspection

Erosion can vary in magnitude from minor repairs to embankment ruts, energy dissipaters and rilling to major gullies in the embankments and spillways. The repair of eroded areas may require the use of excavators, earthmoving equipment, riprap and erosion control blankets. Extreme care should be taken when utilizing motorized or heavy equipment to ensure damage to the underdrain system or subsurface layer’s porosity does not occur. All areas should be repaired in-kind and fully stabilized.

▪ **Vegetation Removal/Tree Thinning**

Frequency: As necessary based on inspection

Dense stands of woody vegetation or trees can create maintenance problems within the facility. Tree roots can damage structures and invade pipes/channels thereby blocking flows. Trees growing near the facility may drop material that could clog the subsoils. All trees growing near inflows, outlet structure, emergency spillways or on embankments should be removed.

▪ **Clearing Underdrains and Outflows**

Frequency: As necessary based on inspection

The facility contains an outlet structure and underdrain system that allows treated runoff to exit the facility. These systems can develop blockages that result in a decrease in the hydraulic capacity and create standing water. Specialized equipment or qualified personnel may be required to clear debris from these structures.

Major Maintenance Activities:

These typically involve: large quantities of pollutants/sediment/filter media/landscaping material removal, severe erosion involving; gullies, excessive soil displacement, settlement or holes, and structural repairs to damaged items. These maintenance activities should be performed as a frequency as needed based on inspections. Extreme care should be taken when utilizing motorized or heavy equipment to ensure damage to the underdrain system or subsoils porosity

does not occur. These activities may require an engineer design or jurisdictional approval. Consult appropriate authorities before proceeding with these activities.

C. Grass Swales and Buffers

Features:

- Swale Bottom – a shallow micro-pool located at the inflow point(s) of the basin designed to provide pre-treatment. Typically, this pool is designed to have permanent standing water.
- Side Slope – this is a flat area which typically consists of specific plant materials and mulch. This surface area is designed to allow for slow infiltration to subsurface layers.
- Buffer Strip – This is a subsurface layer under the infiltration bed that contains amended planting soil meeting certain specifications and containing void space for detention storage. This layer is designed to allow for slow infiltration to the lower layer.
- Underdrain – This is a subsurface layer below the Amended Planting Soil layer that contain gravel and an underdrain. The gravel provides void space for detention storage. Where native soils allow, this layer is designed to infiltrate stored runoff. Runoff not infiltrated is collected in the underdrain.
- Level Spreader – Located in the gravel layer, this consists a very moderately sloped perforated pipe designed to capture runoff which will not be infiltrated and convey it to the discharge pipe.

Typical Maintenance Matrix

| Maintenance Activity: Component: | Sediment Removal/ Outlet Cleaning | Mowing/ Weed Control | Trash & Debris Removal | Erosion/ Rutting/ Bare Earth | Overgrown Vegetation Removal | Structure Repair |
|-------------------------------------|--------------------------------------|-------------------------|---------------------------|------------------------------------|------------------------------------|---------------------|
| Swale Bottom | X | | X | X | | X |
| Side Slope | X | X | X | X | X | |
| Buffer Strip | X | X | X | X | X | |
| Inflow Point | | | | | | |
| Underdrain | X | | | | | |
| Level Spreader | X | | X | | | X |

Routine Maintenance Activities:

▪ **Mowing**

Frequency: Twice Annually, or as needed

Routine mowing of the embankments is necessary to maintain an appropriate grass height and to improve the overall appearance. Native vegetation should be mowed to a height of 4-6 inches tall. Grass clippings should be bagged to prevent potential contamination of the filter media.

▪ **Trash/Debris Removal**

Frequency: Twice Annually, or as needed, performed prior to mowing operations.

Trash and debris should be removed from the area to allow for proper functioning and to improve aesthetics. This activity should be performed prior to mowing operations.

▪ **Level Spreader**

Frequency: Routine – As needed based on inspection

Evidence of uneven flow or localized erosion downstream of the level spreader may be an indication that flow is not evenly distributed along the length of the spreader. Areas of erosion should be repaired, filled and revegetated. Causes for the erosion should be investigated and repaired.

▪ **Weed Control**

Frequency: Routine – As needed based on inspection

Undesirable vegetation can grow in and around the area and significantly affect the performance by causing debris/sediment to accumulate, damaging the filter media and underdrain system, and reducing the hydraulic capacity. This includes dense shrubs, grasses and noxious weeds.

Vegetation removal activity is typically performed through mechanical means (mowing/pulling).

▪ **Underdrain System Check**

Frequency: Periodically

With proper maintenance of the surface components of the facility, there should be a minimum amount of maintenance required on the underdrain system. Inspection ports or clean-outs may be used to determine if subsurface layers are retaining water.

▪ **Mosquito Treatment**

Frequency: As needed

With the exception of a pre-treatment area, these areas are intended to drain and should not have areas of standing water which creates mosquito habitat. Any observed standing water or boggy conditions should be investigated and remediated as necessary.

Minor Maintenance Activities:

▪ **Sediment Removal**

Frequency: As needed based on inspection, typically every 1-2 years.

Sediment removal is necessary to ensure proper function of the areas. Care should be taken when removing sediment to prevent damage to the grass and surrounding areas. Minor sediment removal can typically be addressed with shovels, rakes, and smaller equipment. Excessive amounts of sediment are an indication of upstream erosion or lack of adequate BMP's during construction activities. Causes for contributions of excess sediment should be investigated and addressed. Extreme care should be taken when utilizing motorized or heavy equipment to ensure damage to the underdrain system or porosity of the subsurface soils does not occur. Removed sediments do not meet the criteria of "hazardous waste" however, these sediments are contaminated with a wide array of organic and inorganic pollutants and must be handled with care. Sediment should be carefully removed during dry weather to prevent adverse downstream impacts. Removed sediments should be dewatered and then transported by vehicle to a proper disposal site (ie. Landfill, etc.). If necessary, restabilize any bare areas.

▪ **Erosion Repair**

Frequency: As needed based on inspection

Erosion can vary in magnitude from minor repairs to embankment ruts, energy dissipaters and rilling to major bullies in the embankments and spillways. The repair of eroded areas may require the use of excavators, earthmoving equipment, riprap and erosion control blankets. Extreme care should be taken when utilizing motorized or heavy equipment to ensure damage to the

underdrain system or subsurface layer's porosity does not occur. Major erosion is generally the result of excessive velocities caused by steep slopes. It may be necessary to make design improvements to the swale or buffer when erosion because a major maintenance item. All areas should be repaired in-kind and fully stabilized.

▪ **Vegetation Removal**

Frequency: As necessary based on inspection

Weeds, shrubs and other unwanted vegetation that develops in the grass swale or buffer area may impede the flow and cause standing water or backflow problems. It is necessary to remove unwanted vegetation as soon as it appears and restore the correct grade. Revegetate with seed or sod.

▪ **Clearing Underdrains**

Frequency: As necessary based on inspection

The area contains an underdrain system that allows treated runoff to infiltrate and exit the facility. These systems can develop blockages that result in a decrease in the hydraulic capacity and create standing water. Specialized equipment or qualified personnel may be required to clear debris from these structures.

▪ **Level Spreader**

Frequency: As necessary based on inspection

Level spreaders that are no longer level, or have developed damaged areas of cracking or spalling, allow flows to concentrate in these depressed areas instead of being distributed over the length of the structure. Also, build-up of grasses along the edge of the spreader may create an uneven flow distribution. Rills, gullies and other erosion that develops downstream of level spreaders should be repaired and reseeded or sodded. Causes of erosion should be investigated and addressed.

▪ **Fertilization/Soil Amendment**

Frequency: As necessary based on inspection

Grass buffers and swales rely on healthy, dense vegetation in order to function properly. Grasses that appear to be diseased, dying or unhealthy may require amendments. Fertilizers should be applied in the minimum amounts recommended by the manufacturer.

▪ **Vehicle Tracks**

Frequency: As necessary based on inspection

Swales that are adjacent to roadway sections or driveways may be damaged by vehicle tracks. Rutted areas should be filled in and revegetated as soon as possible. Frequent problems associated with vehicle traffic such as around corners, may required a barrier or sign to avoid vehicular traffic within the grassed areas.

Major Maintenance Activities:

These typically involve: large quantities of pollutants/sediment/filter media/landscaping material removal, severe erosion involving; gullies, excessive soil displacement, settlement or holes, and structural repairs to damaged items. These maintenance activities should be performed as a frequency as needed based on inspections. Extreme care should be taken when utilizing motorized or heavy equipment to ensure damage to the underdrain system or subsoils porosity does not occur.

These activities may require an engineer design or jurisdictional approval. Consult appropriate authorities before proceeding with these activities.

Common Maintenance Items:

- Displaced/Settled rip-rap – rip-rap that appears to have settled, has soil present between stones, or has shifted may be required maintenance for continued erosion prevention.
- Erosion/Rutting – Erosion at the inflow is common and rutting sometimes occurs along pond banks, both situations require maintenance to prevent continued erosion.
- Sediment Accumulation – Sediment often deposits immediately downstream of the inflow point and in the forebay. To prevent a loss in hydraulic performance, sediment must be removed in a timely manner. Routine removal can reduce the need for dredging of the entire facility.
- Outflow Clogging – If after several dry days, the basin permanent water surface elevation is not below the invert of the low-flow discharge point in the outlet structure, than the outfall may be clogged. Removing clogging either upstream or downstream of the outfall should be done.
- Structural Damage – This can occur anytime during the life of the facility. Typically, at inflow points it involves the flare end section becoming removed from the barrel. The outlet structure can crack, spall and settle. Steel trash racks and well screens are susceptible to damage. Outfall points may become blocked with trash or woody debris. This can lead to operational problems with the facility.
- Woody Growth/Weeds – undesirable or heavy vegetation growing in or around the inflow or outflow points can effect performance and result in blockages. Tree roots can cause damage to structural components or embankments during flood events. Routinely mowing the facility will remove these plants when they start to grow.
- Petroleum/Chemical Sheen – If sheens, odors, discolored soil or dead vegetation are observed in the micro-pools, this may indicate an illicit discharge is reaching the facility. If this is observed, contact the entity listed in this manual who is responsible for the long-term operation and maintenance of the site. Proper removal/mitigation of contaminated soils and water in the facility is necessary to minimize downstream impacts. Additionally, the source of the contamination should be identified and pre-cautions and procedures implemented to prevent future occurrences.
- Mosquitoes/Algae Treatment – Nuisances created by stagnant water can result from improper maintenance and treatment of the forebay and deep pool. Chemical/mechanical treatment of the permanent pools may be necessary to reduce these impacts if they have the potential to effect adjacent residential areas.
- Trash Rack/Well Screen Clogged – Floatable material that enter the facility will most likely make its way to the outlet structure. This material may be trapped against the trash rack or outlet grate. This material must be removed on a routing basis to ensure the outlet structure drains as designed.
- Burrowing Animals/Pests – Burrowing rodents may cause damage to the embankments by reducing their structural operation during large storm events.

APPENDIX G

References

APPENDIX H

SWPPP Qualified Inspection Reports